

COASTAL CONSERVANCY

Staff Recommendation

April 24, 2008

**INVASIVE *SPARTINA* PROJECT (ISP)
PHASE II-CONTROL PROGRAM
2008-2010 IMPLEMENTATION OF CONTROL PROGRAM**

File No. 99-054

Project Manager: Maxene Spellman

RECOMMENDED ACTION: Authorization to 1) accept an augmentation in the amount of \$249,425 to an existing grant from the Wildlife Conservation Board to implement the Invasive *Spartina* Project (ISP) Control Program and disburse the full amount of the augmentation for 2008 treatment and eradication projects within the San Francisco Estuary; and 2) disburse up to \$1,972,190 of Conservancy funds to implement the ISP Control Program for 2008 for treatment and eradication projects within the San Francisco Estuary, and for environmental consulting services needed to operate and manage the ISP Control Program through spring of 2010.

LOCATION: The baylands and lower creek channels of the nine counties that bound the San Francisco Bay.

PROGRAM CATEGORY: San Francisco Bay Area Conservancy

EXHIBITS

Exhibit 1: September 25, 2003 Staff Recommendation

Exhibit 2: June 16, 2005 Staff Recommendation

Exhibit 3: Map of 2008 Treatment Sites

Exhibit 4: Map of Coastal Marin Infestations

Exhibit 5: Map of North San Pablo Bay Treatment Sites

Exhibit 6: Invasive *Spartina* Control Plans for the San Francisco Estuary, 2008-2010 Control Seasons

Attachment 1: *Spartina* Control Site Maps

Attachment 2: Impact and Mitigation Checklists

Exhibit 7: May 24, 2007 Staff Recommendation

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RESOLUTION AND FINDINGS:

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Chapter 4.5 of Division 21 of the Public Resources Code:

“The State Coastal Conservancy hereby authorizes the following:

1. Acceptance of an augmentation in the amount of \$249,425 (two hundred forty-nine thousand four hundred twenty-five dollars) to the existing grant to the Conservancy from the Wildlife Conservation Board (WCB) to implement the Invasive *Spartina* Project (ISP) Control Program for 2008.
2. Disbursement of up to \$223,152 (two hundred twenty-three thousand one hundred fifty-two dollars) of Conservancy funding and up to \$249,425 (two hundred forty-nine thousand four hundred twenty-five dollars) of the WCB grant for invasive *Spartina* treatment and eradication projects in 2008 and planning for such activities in 2009 under the ISP Control Program. Funds for treatment and eradication projects may be used to supplement existing grants to the California Wildlife Foundation, Friends of Corte Madera Creek Watershed, the East Bay Regional Park District, City of Alameda, City of San Leandro, the San Mateo County Mosquito Abatement District, the California Department of Parks and Recreation, and United States Fish and Wildlife Service Don Edwards San Francisco Bay National Wildlife Refuge. Any grant of funds for treatment and eradication shall be subject to the following conditions:
 - a. Prior to disbursement of funds for treatment and eradication activities, there shall be in place a fully executed amendment to the Memorandum of Understanding between the Conservancy and WCB authorizing an augmentation of funding and identifying the 2008 ISP Control Program activities as an addition to the previously approved ISP project.
 - b. Prior to implementing any treatment and eradication project and prior to disbursement of any funds to the grantee, the grantee shall submit for review and approval of the Executive Officer a plan detailing the site-specific work for 2008, based on the outcome and extent of the 2007 treatment and including a list of identified mitigation measures, a work program for 2008 treatment and 2009 activities, if applicable, including a schedule and budget, and evidence that the grantee has obtained all necessary permits and approvals for the project.
 - c. In carrying out any treatment and eradication project, the grantee shall comply with all applicable mitigation and monitoring measures that are set forth in the approved site-specific plan, that are required by any permit, the amended Biological Opinion or approval for the project, and that are identified in the “Final Programmatic Environmental Impact Statement/Environmental Impact Report,

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San Francisco Estuary Invasive *Spartina* Project: *Spartina* Control Program” (FEIS/R), adopted by the Conservancy on September 25, 2003.

3. Disbursement of up to \$1,749,038 (one million seven hundred forty-nine thousand thirty-eight dollars) of Conservancy funding for ongoing environmental consulting services needed to operate and manage the ISP Control Program on an accelerated schedule through spring of 2010.”

Staff further recommends that the Conservancy adopt the following findings:

“Based on the accompanying staff report and attached exhibits, the State Coastal Conservancy hereby finds that:

1. Disbursement of additional funds for the ISP Control Program treatment and eradication projects, and ongoing management, is consistent with Public Resources Code Sections 31160-31165 and with the resolutions, finding and discussion accompanying the Conservancy authorizations of September 25, 2003 and June 16, 2005, as shown in the staff recommendations attached as Exhibits 1 and 2 to this staff recommendation.
2. The proposed authorization is consistent with the Project Selection Criteria and Guidelines last updated by the Conservancy on September 20, 2007.
3. The California Wildlife Foundation and Friends of Corte Madera Creek Watershed are private nonprofit organizations existing under Section 501(c)(3) of the United States Internal Revenue Code, whose purposes are consistent with Division 21 of the California Public Resources Code.
4. On June 16, 2005 the Conservancy authorized initial funding for the 2005 and 2006 ISP Control Program treatment and eradication projects at 22 different sites (the original treatment projects), under site-specific plans for each site, and made appropriate findings under the California Environmental Quality Act (CEQA). This authorization provides for additional funding for those same 22 original treatment projects. The nature, duration and extent of the original treatment projects, including environmental effects and proposed mitigation measures, was fully described and considered by the Conservancy in connection with the initial funding authorizations and have not changed, other than by extending the same (or less extensive) work into 2008 (See Exhibit 6). Disbursement of additional funds for the original treatment projects is, thus, consistent with the previous CEQA finding: that the environmental effects associated with the proposed original treatment projects and the mitigation measures needed to reduce or avoid those effects were fully identified and considered in the FEIS/R adopted by the Conservancy in September 25, 2003. (See Exhibits 1 and 2).
5. On May 24, 2007, the Conservancy authorized 2007 funding for the ISP Control Program treatment and eradication project at the Petaluma River Watershed site (the Petaluma River treatment project), under a site-specific plan for the site, and made appropriate findings under CEQA. Work under the ISP Control program at the Petaluma River treatment project site will continue into 2008, without the need for additional funding. The nature, duration and extent of the Petaluma River treatment

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project, including environmental effects and proposed mitigation measures, was fully described and considered by the Conservancy in connection with the initial funding authorization and has not changed, other than by extending the same (or less extensive) work into 2008 (See Exhibit 7). Extending work into 2008 for the Petaluma River treatment project is, thus, consistent with the previous CEQA finding: that the environmental effects associated with the proposed treatment projects and the mitigation measures needed to reduce or avoid those effects were fully identified and considered in the FEIS/R adopted by the Conservancy in September 25, 2003. (See Exhibits 1 and 7).

6. This authorization provides funding for an additional treatment and control project at the North San Pablo Bay site (North San Pablo Bay treatment project). Based on the “Invasive Spartina Control Plans for the San Francisco Estuary, 2008-2010 Control Seasons” (Site 26: North San Pablo Bay, Napa & Solano Counties); and “Impact and Mitigation Checklists” (North San Pablo Bay, Napa & Solano Counties Site-Specific Impact Evaluation and Site Specific Mitigation Checklists), attached to the accompanying staff recommendation as Exhibit 6 and its Attachment 2, respectively, the environmental effects associated with the North San Pablo Bay treatment project proposed for grant funding and coordination by the Conservancy under this authorization and the mitigation measures to reduce or avoid those effects were fully identified and considered in the FEIS/R adopted by the Conservancy September 25, 2003. (See Exhibit 1).”

PROJECT DESCRIPTION:

Introduction

As detailed in previous staff recommendations (Exhibits 1 and 2), treatment and control of invasive *Spartina* and its hybrids within the San Francisco Bay Estuary are critical to the long-term health of the Estuary and to the species which inhabit and rely upon the salt marshes and tidal flats along its perimeter. Invasive *Spartina* spreads at a greater than exponential rate, and every tidal marsh restoration project implemented within the south and central San Francisco Bay Estuary in the past 15 years has been invaded by non-native invasive *Spartina*. Invasive *Spartina* also threatens to spread out the Golden Gate and north and south along the California coastline.

For the past eight and one half years the Conservancy has managed the regionally coordinated effort to bring the infestation under control and is now moving towards eradication. The Conservancy advanced the project through, among other actions, 1) in 2003 adoption of the “Programmatic Environmental Impact Statement/Environmental Impact Report, San Francisco Estuary Invasive *Spartina* Project: *Spartina* Control Program” (FEIS/R), 2) in 2004 implementation of treatment at 12 demonstration sites (Phase I of the Invasive *Spartina* Control Program), and 3) from 2005 through 2007 implementation of region-wide treatment, monitoring, and adaptive management at 23 sites (covering 139 sub-sites) utilizing a mix of control methods at all known infested sites (Phase II of the Control Program).

Overall, since 2000 the Conservancy has expended \$9,995,682 for the Invasive *Spartina* Project. Out of this total, \$7,805,825 came to the Conservancy from three CALFED

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grants (one federal- and two state-funded), a National Wildlife Foundation grant, a United States Fish and Wildlife Service grant, and a Wildlife Conservation Board grant. The remainder of \$2,189,857 was funded by the Coastal Conservancy. Most recently, in March 2007, the Conservancy authorized disbursement of funding for treatment of the Invasive *Spartina* Project (ISP) Control Program through the 2007 treatment season, and management through spring 2008.

2007 Project Accomplishments

Having established control over the invasive *Spartina* populations Bay-wide in 2006 by realizing a significant overall reduction in acreage as well as halting seed production and dispersal over the majority of the Estuary, the Conservancy's Invasive *Spartina* Project (ISP) continued in 2007 to advance towards its goal of eradication.

The ISP Control Program was able to simultaneously expand treatment to more of the known sites around the Bay while reducing the acreage treated due to the success of previous years: 139 *Spartina* sub-areas covering 1,050 acres were treated, representing 99% of the estimated *Spartina* acreage in the Estuary (an increase from 107 sites in 2006 representing 94% of the Bay-wide acreage). Also, the 2007 Treatment Season stretched from May 9 to October 29, continuing the expansion of the treatment window that began in 2006, and shifting towards earlier control work where efficacy tends to be higher and seed production precluded. Pre-September treatments continue to represent the majority of acres treated, when efficacy tends to be higher because the plants are actively growing and circulate the herbicide down to the roots.

There were a number of notable "firsts" for the Control Program in 2007:

- The entire 100-acre Colma Creek complex was treated, with about 40% receiving a lower concentration of the herbicide imazapyr to "chemically mow" the *Spartina*. The purpose of this sub-lethal treatment is to stop seed production and dispersal from this large infestation while preserving the above-ground *Spartina* biomass to ease the impacts to the large population of endangered California clapper rails known to live on the site.
- An important East Bay complex including Oakland Inner Harbor, Coast Guard Island, and all of the Port of Oakland properties were treated.
- All 19 sub-areas of the West San Francisco Bay complex were treated, including the heavily infested area around San Francisco International Airport.
- All remaining 13 sub-areas of the Marin Outliers complex were treated, a complex of smaller invasive *Spartina* populations. Treatment of these sites is important because of their location in the North Bay that allows them to disperse the infestation to new vulnerable locations.

Project Description for 2008 Control Program

The success of *Spartina* treatment from 2005-2007 has enabled the ISP to shift into the next phase of the project. The majority of sites have been reduced significantly to a more scattered distribution over the previous footprint of the infestation. This progress

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necessitates for each year a heightened focus on both identifying and subsequently treating remaining patches and then each and every plant of invasive *Spartina* throughout the Estuary to bring the project closer to the ultimate goal of eradication. In 2008, a higher percentage of treatment will be conducted by spot applications and manual control, replacing the large, mostly aerial broadcast applications that were appropriate at the start of the project when some site complexes had hundreds of contiguous acres of non-native *Spartina*. As a result, there will be a significant increase in labor costs, both for ISP monitoring crews and for the grantees' treatment contractors.

ISP management of the Control Program involves completing three-year updates of 24 treatment plans covering 156 sub-areas, including one new site plan (North San Pablo Bay), and submitting these documents to the US Fish and Wildlife Service (FWS) for an amended Biological Opinion to authorize treatment. Other ongoing ISP responsibilities include making presentations to regional stakeholders, obtaining necessary permits, preparing and implementing ISP's Water Quality Monitoring Plan and reports, continuing the inventory monitoring and California clapper rail monitoring, continuing the telemetry study examining Clapper rail movement, coordinating replanting in Corte Madera Creek watershed and some East Bay Regional Park District sites, and continuing to seek landowner permissions to work on sites where work has not previously been done.

Treatment will also extend over a longer season in 2008. Clapper rail monitoring over the past three years has shown an increase in the number of rails at treated sites rather than the decrease that was expected. As a result, FWS is expected to approve earlier access to some clapper rail sites to increase efficacy and expand the potential treatment window to accommodate the increased work load of ground-based treatment and spot control that will replace broadcast applications.

The ISP also conducted a drift card study which found that simulated seeds in drift card form can travel from heavily infested sites to Point Reyes National Seashore, Stinson Beach, and other areas of the outer coast. Cards also released from infested sites in the Central Bay turned up in the Don Edwards National Wildlife Refuge and in areas of the South Bay Salt Ponds that are scheduled to be opened to tidal exchange in the near future. These findings add a sense of immediacy to the goal of eradication which will be facilitated by approval of a longer treatment window with earlier access to clapper rail sites.

As would be expected given the results of the drift card study, small infestations of invasive *Spartina*, likely originating from seeds from the San Francisco Estuary, are found along the Marin coastline at Tomales Bay, Drakes Estero, Limantour Estero, and Bolinas Lagoon. (See Exhibit 4, Map of Coastal Marin Infestations.) Altogether these plants cover less than one acre. For the past few years ISP assisted the National Park Service (NPS), the primary landowner, and others on utilizing hand pulling and covering to control the small infestations. While NPS and other landowners experienced some success in removing invasive *Spartina*, new but a limited number of plants re-sprouted, and new seedlings continue to establish periodically. To prevent further spread along the coast staff recommends that ISP incorporate these sites into the ISP Control Program to enable the coordinated strategy for eradication employed within the Bay to date to extend to the outer coast. This will necessitate a revision to the project description included in

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the Final Programmatic Environmental Impact Statement/Environmental Impact Report, San Francisco Estuary Invasive *Spartina* Project: *Spartina* Control Program (“FEIS/EIR”), an assessment of the environmental impact of the expanded scope of treatment, including potential impacts to special status species and cumulative impacts, and preparation of appropriate additional environmental documentation, as needed, depending on the nature of the impacts associated with the expanded project. The proposed authorization proposal includes additional funding to undertake these activities. Staff will return to the Conservancy with the appropriate documentation analyzing potential impacts of treatment at the coastal sites prior to incorporating these sites into the regionally coordinated ISP Control Program.

The Conservancy and ISP continue to make progress in the realm of stakeholder development, motivating land managers to take a greater stewardship role in their marshes. An integral part of the strategy is to establish a strong network in place for the post-ISP landscape by fostering dedication to the goals of the project, and strengthening knowledge of how to address various issues when they arise. In addition, through the South Bay Salt Pond Project Management Team, the Conservancy, ISP, FWS, the Department of Fish and Game and others, are refining Best Management Practices to guide landowners and managers for long term stewardship.

Newly Infested Site: North San Pablo Bay

Due in part to the heightened focus on identifying patches of invasive plants, the ISP Monitoring Program recently found a new small infestation of invasive *Spartina* and hybrids along the San Pablo Bay National Wildlife Refuge and nearby along the Napa River. Although the invading *Spartina* hybrids total less than 1,000 square feet, the infestation threatens to spread up the Napa River watershed. (See Exhibit 5, Map of North San Pablo Bay Treatment Sites.) These two sub-areas will be treated this year as described in Exhibit 6, which incorporates the site-specific Invasive *Spartina* Control Plan for the North San Pablo Bay. At both sub-areas boats and ground-based treatment will be used to treat *Spartina* with herbicide. Digging of small clusters may be undertaken at appropriate sites along the shoreline, and covering strategies may also be employed where the structure of the infested area will enable long-term placement of fabric without the threat of wave energy displacing it. FWS and the California Transportation Agency (“Caltrans”), the two landowners where the infestations occur, are coordinating with ISP to plan treatment and identify the source of contamination. FWS and the California Wildlife Foundation will undertake eradication activities, although FWS will do so without funding assistance from the Conservancy.

These treatment methods proposed at the new North San Pablo Bay sub-sites are those that are already being undertaken bay-wide for the ISP Control Program. Also, the use of herbicide as one of many possible treatment methods was initially reviewed and approved by the Conservancy on September 25, 2003 (see staff recommendation attached as Exhibit 1), in connection with the initial ISP Control Program authorization and Conservancy certification of the Final Programmatic Environmental Impact Statement/Environmental Impact Report, San Francisco Estuary Invasive *Spartina* Project: *Spartina* Control Program (“FEIS/EIR”). By Addendum to the FEIS/EIR, reviewed by the Conservancy at its June 16, 2005 meeting (see staff recommendation

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attached to Exhibit 2), the Conservancy approved a revision to the ISP Control Program, allowing the use of a newly registered aquatic herbicide, imazapyr (and associated surfactants and colorants), which is more effective and has even less potential effect on the environment than the previously approved herbicide, glyphosate.

As discussed in detail in the “COMPLIANCE WITH CEQA” section, below, there are no potentially significant environmental impacts associated with the treatment of the newly infested sites on the shores of the San Pablo Bay National Wildlife Refuge and the Napa River that were not considered in the certified FEIS/EIR. All mitigation measures identified in the FEIS/EIR, which will reduce potentially significant impacts to less than significant, will be carried out before, during and after treatment. (See Exhibit 6: “Invasive Spartina Control Plans for the San Francisco Estuary, 2008-2010 Control Seasons”, pages 174-181 entitled “Site 26 - North San Pablo Bay, Napa & Solano Counties”; and Attachment 1 to Exhibit 6: The two last checklists entitled “Impact and Mitigation Checklists, North San Pablo Bay, Napa & Solano Counties Site-Specific Impact Evaluation and Site Specific Mitigation Checklists”.)

PROJECT FINANCING:**A. Financing for this Authorization:**

Coastal Conservancy	\$1,972,190
WCB grant to the Coastal Conservancy	\$249,425
Treatment Grantees’ Contributions	\$ 116,000
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Total	\$2,337,615

Conservancy funding for the treatment and eradication activities and ongoing management of ISP is expected to come from the fiscal year 2005/06 appropriation to the Conservancy from the Water Security, Clean Drinking Water, Coastal Beach Protection Fund of 2002 (Proposition 50). Proposition 50 authorizes the use of these funds for the purpose of protecting coastal watersheds through projects to restore land and water resources. Funds may be used for planning and permitting associated with restoration, as well as the restoration activities. (Water Code Section 79570). The use of Proposition 50 funds for treatment activities and the ongoing environmental consulting services needed to operate and manage the *Spartina* Control Program will accomplish these purposes. The consulting services are needed specifically to plan, coordinate and obtain environmental permits and approvals for the ISP Control Program, which will allow for the restoration of the coastal watershed and associated wetlands affected by invasive *Spartina*. In addition, as required by Proposition 50, the proposed project is consistent with local and regional plans (Water Code Section 79507). The Goals Report is a multi-jurisdictional local planning document providing guidance for watershed protection activities for the San Francisco Bay. Proposition 50 recognizes the *San Francisco Baylands Ecosystem Habitat Goals Report* (“Goals Report”) as appropriate to guide the

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selection of restoration projects within the Bay region (Water Code Section 79572). As discussed in the paragraph below, the ISP Control Program carries out the objectives of the Goals Report.

Conservancy funding for the proposed disbursement of \$249,425 for invasive *Spartina* treatment and eradication projects is expected to be provided under an existing grant agreement by which WCB may provide funds to the Conservancy for San Francisco Bay projects. Under the grant agreement with WCB, the Conservancy may use these funds for wetland habitat restoration projects within the nine-county San Francisco Bay Area that implement the restoration goals of the San Francisco Bay Joint Venture (“SFBJV”) and the Goals Report and that meet the priorities of the Conservancy as described in Section 31162 of the Public Resources Code. In addition, any proposed project must, under the WCB grant agreement, be a “high priority” project as identified in the grant agreement or otherwise authorized as a priority project by WCB in the “Memorandum of Understanding” between WCB and the Conservancy that is required before any project may move forward.

The WCB grant funding, in turn, is derived from an appropriation from the Water Security, Clean Drinking Water, Coastal Beach Protection Fund of 2002 (Proposition 50). The Proposition 50 funds were appropriated under the specific authorization found in Section 79572(c) of the Water Code and may be used for the general purpose of acquisition, protection and restoration of coastal wetlands.

The project meets the criteria of the WCB grant agreement and the related requirements of Proposition 50 in all respects. As required by the WCB grant agreement and Proposition 50, the proposed project serves to protect and preserve fish and wildlife habitat of the San Francisco Bay through restoration of wetlands, and is specifically identified in the WCB grant agreement as a high priority project that specifically benefits the San Francisco Estuary. Further, the project is one that implements the objectives of the SFBJV and Goals Report. It also squarely meets the priorities and objectives of the Conservancy found in Section 31162 of the Public Resources Code, since it carries out the San Francisco Bay Area Conservancy Program’s goal to protect, restore, and enhance natural habitats as detailed under the heading “Consistency with Conservancy’s Enabling Legislation”, below.

B. Breakdown by Grantee of Expected Financing for 2006 Treatment Projects:

Depending on the respective efficacy of the 2007 treatment found at the various project sites, the funding each grantee will receive may be adjusted among grantees, but with no increase to the total amount authorized. While each grantee previously contributed matching funds and in-kind services meant to cover the 2007 treatment season, most will also contribute new matches for the additional funding from the Conservancy for the 2008 treatment season as follows:

<u>Grantee</u>	<u>New SCC Funding</u>	<u>New Grantee Match</u>
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San Mateo Co. Mosquito Abatement District	\$544	\$25,000
California Wildlife Foundation	\$308,531	\$0
East Bay Regional Park District	\$5,000	\$25,000
City of Alameda	\$57,000	\$5,000
City of San Leandro	\$6,303	\$5,000
FWS Don Edwards San Francisco Bay National Wildlife Refuge	\$2,059	\$40,000
Friends of Corte Madera Creek Watershed	\$84,000	\$15,000
California Department of Parks and Recreation	\$9,140	\$1,000
<u>TOTAL</u>	<u>\$472,577</u>	<u>\$116,000</u>

CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:

As described in previous staff recommendations (Exhibits 1 and 2) and associated Conservancy resolutions, the ISP and implementation of the Control Program serve to carry out the objectives for the San Francisco Bay Area Conservancy Program mandated by Chapter 4.5 of the Conservancy's enabling legislation. Both the ISP and its Control Program will serve to protect and restore tidal marshes, which are natural habitats of regional importance (Public Resources Code Section 31162(b)).

Consistent with Public Resources Code Section 31163(c) this project is assigned priority in the San Francisco Bay Area Program: (1) The ISP implements policies of the regional Comprehensive Conservation Management Plan adopted for the San Francisco Estuary by the United States Environmental Protection Agency and stakeholder entities. (2) The project is multi-jurisdictional covering the baylands and lower creek channels of the nine counties and several cities that bound the San Francisco Bay. (3) ISP completed the update of site-specific plans, and grantees are poised to conduct treatment activities for the upcoming treatment season in a timely way. (4) If the regionally coordinated eradication activities are not continued on an aggressive ongoing basis, the exponential spread of invasive *Spartina* and hybrids will cover the intertidal wetlands and mudflats of the San Francisco Estuary and spread to the outer coasts of California, Oregon and

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Washington. (5) ISP partners will again provide matching funds to implement the 2008 Control Program.

**CONSISTENCY WITH CONSERVANCY'S
2007 STRATEGIC PLAN GOAL(S) & OBJECTIVE(S)**

Consistent with **Goal 10, Objective K** of the Conservancy's 2007 Strategic Plan, the proposed project will continue implementation of approximately 24 projects to eradicate between 1,000 to 1,800 acres of non-native invasive species that threaten native coastal habitats. If left uncontrolled, non-native invasive *Spartina* will potentially spread up and down the coast to other California estuaries.

Consistent with **Goal 10, Objective C**, the proposed project will continue to implement the ISP Control Program to prevent up to 69,402 acres of marsh and mudflats from being invaded and potentially covered by invasive *Spartina* and hybrids and to preserve and restore natural habitats in the San Francisco baylands.

**CONSISTENCY WITH CONSERVANCY'S
PROJECT SELECTION CRITERIA & GUIDELINES:**

The proposed project remains consistent with the Conservancy's Project Selection Criteria and Guidelines, last updated September 20, 2007, in the following respects:

Required Criteria

1. **Promotion of the Conservancy's statutory programs and purposes:** See the "Consistency with Conservancy's Enabling Legislation" section above.
2. **Consistency with purposes of the funding source:** See the "Project Financing" section above.
3. **Support of the public:** The 2008 ISP Control Program, and its management through spring 2010, are strongly supported by findings of the Third International Invasive *Spartina* Conference (November, 2004). Renowned scientists from the San Francisco Bay Area, other coastal states, and around the world agree that the Conservancy should continue its aggressive actions to eradicate invasive *Spartina* from the Estuary. The objective of eradication of invasive *Spartina* is also specifically supported in the Goals Report and by the San Francisco Bay Joint Venture. Furthermore, in the published Comprehensive Conservation Management Plan for the San Francisco Estuary, San Francisco Estuary Project stakeholders have identified control of invasive species as the top priority for the restoration and protection of the Estuary.
4. **Location** This project is located in the nine San Francisco Bay Area Counties to benefit the restoration of the San Francisco baylands.
5. **Need:** Augmentation of funding for ISP's existing grants for treatment and eradication of invasive *Spartina*, are needed because of the aggressive eradication

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strategy planned for 2008/2009 combined with the surprisingly high costs of the herbicide imazapyr and of applicator specialists.

6. **Greater-than-local interest:** Introduced *Spartina* threatens to move up stream in the San Francisco Bay-Delta, and down the coast to southern California. In the San Francisco Bay, introduced *Spartina* threatens to displace state and federally listed species, such as the endangered California clapper rail, California black rail, and the salt marsh harvest mouse.

Additional Criteria

5. **Urgency:** As confirmed at the Third International Invasive *Spartina* Conference, experts from the region and around the world believe that if the spread of introduced *Spartina* is not controlled within the next few years, the greater than exponential spread of the plants and extensive hybridization with the native *Spartina foliosa* will preclude any chance for successful control in the future. If the Conservancy and its partners can address the problem with the appropriately stepped up level of treatment in the short-term, long-term maintenance expenses can be avoided.
6. **Readiness:** In 2007, ISP and partners treated 1,050 acres of invasive *Spartina*. Environmental service consultants and grantees are already fully engaged in the pre-treatment season planning, including updating the existing Site-Specific Plans, and are eager to continue treatment in 2008. Also, US Fish and Wildlife Service and the California Wildlife Foundation are on board to carry out treatment of the infestation found at the new North Bay site.
7. **Cooperation:** Existing grantees (landowners and land managers) are enthusiastically collaborating in the updating and implementation of the Site-Specific Plans and for permitting that is being coordinated by the ISP consultants. In addition, coordination with the regulatory agencies is ongoing with regard both to treatment and monitoring activities.

CONSISTENCY WITH SAN FRANCISCO BAY PLAN:

The ISP Control Program is consistent with the San Francisco Bay Plan, Policy 3(c), found in the section entitled “Marshes and Mudflats” (page 9), that states: “the quality of existing marshes should be improved by appropriate measures whenever possible.” The main purpose of this project is to remove invasive *Spartina* to improve the long-term quality of existing marsh habitat in the baylands of the San Francisco Estuary.

COMPLIANCE WITH CEQA:

As part of the June 16, 2005 ISP staff recommendation (Exhibit 2), the Conservancy authorized initial funding for 22 of the treatment and eradication projects that are proposed for additional funding under this authorization. The June 16, 2005 staff recommendation refers to 22 treatment sites. However, after the June authorization, one of the 22 sites was split into 2 sites for ease of treatment management while another site dropped out bringing the total again to 22 sites (the original treatment sites). On May 24, 2007, the Conservancy authorized a redirection of funds for treatment activities along the

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Petaluma River (see Exhibit 7, May 24, 2007 Staff Recommendation), thus resulting in 23 treatment sites for 2007. The North San Pablo Bay site has been added as a new treatment site for 2008, increasing the total to 24 treatment sites for 2008.

The Conservancy's June 16, 2005 authorization (Exhibit 2) included consideration and review of the site specific plans for each of the 22 original treatment sites for activities through 2007. The May 24, 2007 authorization (Exhibit 3) included consideration and review of the one-year site-specific plan for treatment of the Petaluma River site. Based on this information, staff recommended and the Conservancy found that the environmental effects associated with each of these treatment projects and the required mitigation to reduce those effect to less than significant level had been fully considered under the Conservancy-certified (See Exhibit 1) programmatic "Final Programmatic Environmental Impact Statement/Environmental Impact Report, San Francisco Estuary Invasive *Spartina* Project: *Spartina* Control Program" (FEIS/R) prepared for the ISP Control Program pursuant to the California Environmental Quality Act (CEQA) and that no new mitigation measures were required.

The three-year updated site-specific plans and mitigation matrices for activities through 2010 for all of these 23 sites (original treatment sites plus Petaluma River site) are attached (See Exhibit 6). These plans have not changed substantially in nature, extent, duration or scope since 2005 for the original treatment sites, and since 2007 for the Petaluma River site, with the exception of some additional sub-areas added as new plants were found. Overall, treatment and potential impacts are reduced because of successful treatment in the prior three years.

Since the projects, including potential environmental effects and mitigation measures, remain unchanged, the proposed authorization remains consistent with the CEQA finding adopted by the Conservancy in connection with the June 16, 2005 authorization for the 22 original treatment sites and with the May 24 2007 authorization for the Petaluma River site. No further environmental documentation for these treatment activities is required.

The ISP will coordinate one new site-specific treatment and control project, the aforementioned North San Pablo Bay site, for which a site-specific plan and mitigation matrix, identifying the potential impacts and necessary mitigation measures associated with the site-specific activities, have also been incorporated into the three-year updated site-specific plans and mitigation matrices for activities through 2010 (Exhibit 6). This project likewise falls under the FEIS/R. The FEIS/R was adopted by the Conservancy through its September 25, 2003 resolution certifying the EIR (Exhibit 1) and is available for review at the offices of the Conservancy and at <http://www.spartina.org/project.htm>.

The FEIS/R is a *programmatic* Environmental Impact Report (Section 15168 of the CEQA Guidelines, 14 Cal. Code of Regulations, Sections 15000 *et seq.*, hereafter "Guidelines") in that it analyzes the potential effects of implementing treatment methods for a regional program rather than the impacts of a single individual project. This program-level EIS/R identifies mitigation measures that will be applied to reduce or eliminate impacts at specific treatment locations under a wide range of potential conditions and a variety of treatment modalities. The Conservancy may use the FEIS/R as

INVASIVE SPARTINA PROJECT (ISP) PHASE II- CONTROL PROGRAM

a basis for “tiered” CEQA review and approval of individual treatment projects under the Control Program, including the new treatment proposed by this staff recommendation.

A subsequent activity that follows under a program EIR that has been assessed pursuant to CEQA must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared. If the agency proposing the later activity finds that its effects and required mitigation to reduce those effects were already identified and considered under the program EIR, the activity can be approved with no further environmental documentation (CEQA Guidelines, Section 151168 (c)). The Guidelines suggest the use of a written checklist or similar device to document the evaluation of the activity to determine whether the environmental effects of the operation were covered in the program EIR.

The new North San Pablo Bay treatment project has a prepared site-specific plan, describing the site and identifying the precise treatment activities proposed (Exhibit 6). In addition, it has been assessed by use of a checklist matrix to determine whether the effects of those activities and the mitigation required have been considered by the FEIS/R (Exhibit 6, Attachment 1).

As this documentation demonstrates, the program FEIS/R did fully consider all of the potential environmental effects associated with the project and there are no new mitigation measures beyond those imposed by the FEIS/EIR that are required for the new treatment activities on the North San Pablo Bay site. Conservancy staff thus recommends that the Conservancy adopt a finding to that effect.

SITE-SPECIFIC PROJECT MITIGATION

Site Name: Palo Alto Baylands, Santa Clara County

TSN: ISP-2004-8

<i>Impact</i>	<i>Applicable Mitigation & Conservation Measures</i>	<i>Herbicide</i>	<i>Dig</i>	<i>Covering</i>	<i>Implementation Timing</i>	<i>Verification Signatures</i>	
						<i>Implementing Entity</i>	<i>ISP Field Supervisor</i>
WQ-1: Degradation of Water Quality due to Herbicide Application	Apply herbicide directly to plant at low tide and according to label. (WQ-1;CM-3,4)	X			During treatment		
WQ-2: Degradation of Water Quality due to Herbicide Spills	Apply under supervision of trained applicator (WQ-2;CM-3)	X			During treatment		
	Implement spill and containment plan provided or approved by ISP (WQ-2;CM-17)	X			During treatment		
WQ-3: Degradation of Water Quality due to Fuel or Petroleum Spills	Implement spill and containment plan provided or approved by ISP (WQ-3;CM-17)	X			During treatment		
BIO-1.2: Effects on tidal marsh plant communities affected by Atlantic smooth cordgrass and its hybrids.	Minimize entry and re-entry into marsh, define access points (BIO-1.2;CM-1)	X	X	X	During treatment		
	Avoid staging in high, dense vegetation such as gumplant or pickleweed (FWS GL)	X	X	X	During treatment		
	Avoid herbicide application to non-target vegetation adjacent to treatment area (BIO-1.2;CM-4)	X			During treatment		
BIO-3: Effects on shorebirds, waterfowl & marshland birds	Avoid working within 1,000 feet of occupied mudflats during peak Pacific Flyway stopovers (BIO-3)	X	X	X	During treatment		
	Occupy treatment area soon after high tide, before mudflats emerge (BIO-3)	X	X	X	During treatment		
	Haze shorebirds to minimize potential direct contact with herbicide drift (BIO-3)	X	X	X	During treatment		

*Impact numbering from ISP Control Program Programmatic EIS/R, September 2003.

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Mitigations are from corresponding numbered mitigation in the same document,

Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Palo Alto Baylands TSN: ISP-2004-8

Impact	Applicable Mitigation & Conservation Measures	Herbicide	Dig	Covering	Implementation Timing	Verification Signatures	
						Implementing Entity	ISP Field Supervisor
BIO-4.1: Effects on the salt marsh harvest mouse and tidal marsh shrew species.	Use shortest possible access route through any pickleweed habitat. Flag areas of repeated access (BIO-4.1;CM-15)	X	X	X	During treatment		
	Use protective mats or other covering over pickleweed in areas or repeated access (BIO-4.1;CM-15)	X	X	X	During treatment		
	Assume presence of SMHM on all suitable sites (CM 14)	X	X	X	During treatment		
	Whenever possible, schedule work after mass mortality events caused by extreme high tides (CM 16).	X	X	X	Pre- and during treatment		
BIO-5.1: Effects on California clapper rail.	Perform work only during Sept 1 thru Feb 1 to avoid CLRA breeding season (BIO-5.1;CM-18)	X	X	X	During treatment		
	For work within the Clapper Rail breeding season, call counts will be performed in the early spring according to FWS protocols (CM-18)	X	X	X	Pre-treatment		
	Provide CLRA Field biologist supervision (BIO-5.1)	X	X	X	During treatment		
	Assure that field personnel are trained in general CLRA biology and CLRA identification and call detection (BIO-5.1)	X	X	X	Pre-treatment and during treatment		
	Report any CLRA activity immediately to ISP Field Supervisor and in post-treatment report (BIO-5.1)	X	X	X	During and post treatment		
BIO-5.3: Effects on tidal marsh song sparrow subspecies and the salt marsh common yellowthroat.	Report any SMSS and SCYE activity immediately to ISP Field Supervisor and in post-treatment report (BIO-5.3)	X	X	X	During and post treatment		
	Avoid spraying or removing Grindelia plants in the marsh	X	X	X	During treatment		

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Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Palo Alto Baylands TSN: ISP-2004-8

Impact	Applicable Mitigation & Conservation Measures	Herbicide	Dig	Covering	Implementation Timing	Verification Signatures	
						Implementing Entity	ISP Field Supervisor
	Watch for Song Sparrow presence in the work area during early season treatment work (pre-August), especially in the smaller, upper reaches of channels.	X	X	X	During treatment		
BIO-6.1: Effects on anadromous salmonids (Winter-run and spring-run Chinook Salmon, steelhead)	Herbicide treatments shall be minimized near channels and mudflats (BIO-6.1)	X			During treatment		
BIO-6.4: Effects on estuarine fish populations of shallow submerged intertidal mudflats and channels.	Minimize spraying near channels (BIO-6.4)	X			During treatment		
	Avoid use of alkyphenol ethoxylate surfactants adjacent to channel to minimize any potential adverse affects on estuarine fish (FWS BO)	X			During treatment		
N-1: Disturbance of Sensitive Receptors	Comply with all local noise ordinances (N-1)	X			During treatment		
HS-1: Worker Injury from Accidents Associated with Manual and Mechanical Cordgrass Treatment	Implement ISP-approved site safety plan or equivalent (HS-1)		X	X	During treatment		
HS-2: Worker Health Effects from Herbicide Application.	Follow handling and application procedures as identified on product label (HS-2;CM-3,17)	X			During treatment		
HS-3: Health Effects to the Public from Herbicide Application.	Minimize drift according to ISP drift management plan (HS-3;CM-3,4,17)	X			During treatment		
	Post appropriate signage (see attached signage requirements) a minimum of 24 hours pre-treatment (HS-3)	X			Pre-treatment		
HS-4: Health effects to workers or the public from accidents associated with treatment.	Maintain ISP or approved equivalent Site Safety and Spill Prevention plan on site (HS-4;CM-3,4,17)	X	X	X	During treatment		

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Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Palo Alto Baylands TSN: ISP-2004-8

<i>Impact</i>	<i>Applicable Mitigation & Conservation Measures</i>	<i>Herbicide</i>	<i>Dig</i>	<i>Covering</i>	<i>Implementation Timing</i>	<i>Verification Signatures</i>	
						<i>Implementing Entity</i>	<i>ISP Field Supervisor</i>
VIS-1: Alteration of Views from Removal of Non-native Cordgrass Infestations.	Post appropriate signage according to ISP signage protocols (VIS-1)	X	X	X	Pre-treatment, during treatment, post-treatment		
CUL-1: Disturbance or Destruction of Cultural Resources from Access and Treatment.	Report all discovered prehistoric or historic resources to the ISP Field Supervisor and a qualified archeologist or historic resources consultant and suspend all work at site until archaeological mitigation has taken place (CUL-1)	X	X	X	Pre-treatment and during treatment		
CM-7: Invasive Species	Monitor cleared patches for recruitment of invasive plant species including perennial pepperweed until native vegetation has become dominant (CM-7)	X	X	X	Post-treatment		

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Mitigations are from corresponding numbered mitigation in the same document,
Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

SITE-SPECIFIC PROJECT MITIGATION

Site Name: Bair & Greco Island Complex, San Mateo County

TSN: ISP-2004-2

Impact	Applicable Mitigation & Conservation Measures	Sub Area Included	Truck	Aerial	Boat	Argo	Back-pack	Implementation Timing	Verification Signatures	
									Implementing Entity	ISP Field Supervisor
GEO-2: Erosion or topographic change of marsh and mudflat by vehicles used in eradication	Minimize vehicle travel in the marsh and mudflats (GEO-2;CM-1)	All sub-areas				X		During treatment		
WQ-1: Degradation of water quality due to herbicide application	Apply herbicide directly to plant at low tide and according to label. (WQ-1; CM-3 & 4)	All sub-areas	X	X	X	X	X	During treatment		
WQ-2: Degradation of water quality due to herbicide spills	Apply under supervision of trained applicator (WQ-2;CM-3)	All sub-areas	X	X	X	X	X	During treatment		
	Implement spill and containment plan provided or approved by ISP (WQ-2;CM-17)	All sub-areas	X	X	X	X	X	During treatment		
WQ-3: Degradation of water quality due to fuel or petroleum spills	Implement spill and containment plan provided or approved by ISP (WQ-3;CM-17)	All sub-areas	X	X	X	X		During treatment		
BIO-1.2: Effects on tidal marsh plant communities affected by Atlantic smooth cordgrass and its hybrids.	Minimize entry and re-entry into marsh (BIO-1.2;CM-1)	All sub-areas	X	X	X	X	X	During treatment		
	Avoid staging in high, dense vegetation such as gumplant or pickleweed (FWS GL)	All sub-areas	X	X	X	X	X	During treatment		
	Avoid herbicide application to non-target vegetation adjacent to treatment area. (BIO-1.2;CM-3,4)	All sub-areas	X	X	X	X	X	During treatment		

*Impact numbering from ISP Control Program Programmatic EIS/R, September 2003.

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Mitigations are from corresponding numbered mitigation in the same document,

Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Bair & Greco Island Complex TSN: ISP-2004-2

Impact	Applicable Mitigation & Conservation Measures	Sub Area Included	Truck	Aerial	Boat	Argo	Back-pack	Implementation Timing	Verification Signatures	
									Implementing Entity	ISP Field Supervisor
BIO-3: Effects on shorebirds, waterfowl & marshland birds.	Avoid working within 1,000 feet of occupied mudflats during peak Pacific Flyway stopovers. (BIO-3)	All sub-areas	X	X	X	X	X	During treatment		
	Occupy treatment area soon after high tide, before mudflats emerge. (BIO-3)	All sub-areas	X	X	X	X	X	During treatment		
	Haze shorebirds to minimize potential direct contact with herbicide drift. (BIO-3)	All sub-areas	X	X	X	X	X	During treatment		
	Helicopters will not be operated within 1000 feet of active major foraging or roosting sites (BIO-3)	All sub-areas		X				During treatment		
BIO-4.1: Effects on the salt marsh harvest mouse and tidal marsh shrew species.	Use shortest possible access route through any pickleweed habitat. Flag areas of repeated access (BIO-4.1;CM-15)	All sub-areas				X		During treatment		
	Use protective mats or other covering over pickleweed in areas of repeated access (BIO-4.1;CM-15)	All sub-areas	X	X	X	X	X	During treatment		
	Assume presence of SMHM on all suitable sites (CM 14)	All sub-areas	X	X	X	X	X	During treatment		
	Whenever possible, schedule work after mass mortality events caused by extreme high tides (CM 16).	All sub-areas	X	X	X	X	X	Pre- and during treatment		
BIO-4.2: Effects on resident harbor seal colonies of San Francisco Bay.	Minimize vehicle and foot access to marsh within 1000 feet of haul out sites (BIO-4.2)	2a, 2b, 2c, 2f, 2h, 2i		X	X			During treatment		

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Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Bair & Greco Island Complex TSN: ISP-2004-2

Impact	Applicable Mitigation & Conservation Measures	Sub Area Included	Truck	Aerial	Boat	Argo	Back-pack	Implementation Timing	Verification Signatures	
									Implementing Entity	ISP Field Supervisor
	Avoid approaching haul out sites within 2000 feet (or any distance that elicits vigilance behavior) when pups are present. (BIO-4.2)	2a, 2b, 2c, 2f, 2h, 2i		X	X			During treatment		
	Follow ISP spill prevention plan or equivalent BIO-4.2;CM-3,4)	2a, 2b, 2c, 2f, 2h, 2i		X	X			During treatment		
BIO-5.1: Effects on California clapper rail.	Perform work only during Sept 1 thru Feb 1 to avoid CLRA breeding season (BIO-5.1;CM-18)	All sub-areas	X		X	X	X	During treatment		
	For work within the Clapper Rail breeding season, call counts will be performed in the early spring according to FWS protocols (CM-18)	All sub-areas	X		X	X	X	During treatment		
	Provide CLRA Field biologist supervision (BIO-5.1)	All sub-areas	X		X	X	X	During treatment		
	Assure that field personnel are trained in general CLRA biology and CLRA identification and call detection (BIO-5.1)	All sub-areas	X		X	X	X	During treatment		
	Report any CLRA activity immediately to ISP Field Supervisor and in post-treatment report (BIO-5.1)	All sub-areas	X		X	X	X	During treatment		
BIO-5.3: Effects on tidal marsh song sparrow subspecies and the salt marsh common yellow-throat.	Report any SMSS and SCYE activity immediately to ISP Field Supervisor and in post-treatment report	All sub-areas	X		X	X	X	During and post-treatment		
	Avoid spraying or removing Grindelia plants in the marsh	All sub-areas	X	X	X	X	X	During treatment		

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Mitigations are from corresponding numbered mitigation in the same document,

Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Bair & Greco Island Complex TSN: ISP-2004-2

Impact	Applicable Mitigation & Conservation Measures	Sub Area Included	Truck	Aerial	Boat	Argo	Back-pack	Implementation Timing	Verification Signatures	
									Implementing Entity	ISP Field Supervisor
	Watch for Song Sparrow presence in the work area during early season treatment work (pre-August), especially in the smaller, upper reaches of channels.	All sub-areas	X	X	X	X	X	During treatment		
BIO-5.4: Effects on California least terns and western snowy plovers.	Survey access levees for nesting CALT and WESP prior to entry (BIO-5.4;CM-20)	2i, 2j	X		X	X	X	During treatment		
	Report any CALT and WSPL activity immediately to ISP Field Supervisor and in post-treatment report (BIO-5.4)	2i, 2j	X		X	X	X	During treatment		
BIO-5.5: Effects on raptors (birds of prey).	Consult qualified biologist to determine possible raptor nesting presence (BIO-5.5)	All sub-areas		X				Pre-treatment		
	Ensure 500 foot buffer around nests for any helicopter activity (BIO-5.5)	All sub-areas		X				Pre-treatment and during treatment		
BIO-6.1: Effects on anadromous salmonids (winter-run and spring-run Chinook salmon, steelhead).	Target herbicide applications to minimize herbicide use near channel (BIO-6.1).	All sub-areas	X	X	X	X	X	During treatment		
	Avoid use of alylphenol ethoxylate surfactants Dec 1 thru April 1 to avoid steelhead spawning. (BIO-6.1)	All sub-areas	X	X	X	X	X	During treatment		
BIO-6.4: Effects on estuarine fish populations of shallow submerged	Minimize spraying near intertidal mudflats and channels (BIO-6.4)	All sub-areas	X	X	X	X	X	During treatment		

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Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Bair & Greco Island Complex TSN: ISP-2004-2

Impact	Applicable Mitigation & Conservation Measures	Sub Area Included	Truck	Aerial	Boat	Argo	Back-pack	Implementation Timing	Verification Signatures	
									Implementing Entity	ISP Field Supervisor
intertidal mudflats and channels.	Avoid use of alkyphenol ethoxylate surfactants adjacent to channel to minimize any potential adverse affects on estuarine fish (BIO-6.4)	All sub-areas	X	X	X	X	X	During treatment		
BIO-8: Effects of regional invasive cordgrass eradication on mosquito production.	Monitor access route for the formation of un-drained depressions in tire ruts or foot trails (BIO-8)	All sub-areas	X			X	X	During treatment		
	Backfill or cut drainage into shallow depressions left in the marsh by control work to minimize standing water where appropriate (BIO-8)	All sub-areas	X			X	X	Post-treatment		
AQ-1: Dust Emissions	Maintain 15 mph speed limit when traveling on unpaved levees or access roads (AQ-1)	All sub-areas	X					During treatment		
AQ-3: Herbicide effects on air quality.	Implement ISP approved drift management plan (AQ-3;CM-3,4)	All sub-areas		X				During treatment		
N-1: Disturbance of sensitive receptors	Comply with all local noise ordinances (N-1)	All sub-areas	X	X	X	X	X	During treatment		
HS-2: Worker Health effects from herbicide application.	Follow handling and application procedures as identified on product label (HS-2;CM-3)	All sub-areas	X	X	X	X	X	During treatment		
HS-3: Health effects to the public from herbicide application.	Minimize drift according to ISP drift management plan or equivalent (HS-3;CM-3,4)	All sub-areas	X	X	X	X	X	During treatment		

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Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Bair & Greco Island Complex TSN: ISP-2004-2

Impact	Applicable Mitigation & Conservation Measures	Sub Area Included	Truck	Aerial	Boat	Argo	Back-pack	Implementation Timing	Verification Signatures	
									Implementing Entity	ISP Field Supervisor
	Post appropriate signage (see attached signage requirements) a minimum of 24 hours pre-treatment (HS-3)	All sub-areas	X	X	X	X	X	Pre-treatment		
	Avoid scheduling herbicide application near high public use areas during weekends or holidays, or close public access to area 24 hours before and after treatment (HS-3)	All sub-areas	X	X	X	X	X	Pre-treatment and during treatment		
HS-4: Health effects to workers or the public from accidents associated with treatment.	Maintain ISP or approved equivalent Site Safety and Spill Prevention plan on site (HS-4;CM-3,17)	All sub-areas	X	X	X	X	X	During treatment		
VIS-1: Alteration of views from removal of non-native cordgrass infestations.	Post appropriate signage according to ISP signage protocols (VIS-1)	All sub-areas	X	X	X	X	X	Pre-treatment, during treatment, post-treatment		
CUL-1: Disturbance or destruction of cultural resources from access and treatment.	Report all discovered prehistoric or historic resources to the ISP Field Supervisor and a qualified archeologist or historic resources consultant and suspend all work at site until archaeological mitigation has taken place (CUL-1)	All sub-areas	X		X	X	X	Pre-treatment and during treatment		
CUM-2: Cumulative damage to marsh plain vegetation	Coordinate treatment schedule with the Mosquito abatement district in order to minimize cumulative impacts (CUM-2)	All sub-areas	X	X	X	X	X	Pre-treatment		

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Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Bair & Greco Island Complex TSN: ISP-2004-2

<i>Impact</i>	<i>Applicable Mitigation & Conservation Measures</i>	<i>Sub Area Included</i>	<i>Truck</i>	<i>Aerial</i>	<i>Boat</i>	<i>Argo</i>	<i>Back-pack</i>	<i>Implementation Timing</i>	<i>Verification Signatures</i>	
									<i>Implementing Entity</i>	<i>ISP Field Supervisor</i>
CM-7: Invasive species	Monitor cleared patches for recruitment of invasive plant species including perennial pepperweed until native vegetation has become dominant (CM-7)	All sub-areas	X	X	X	X	X	Post-treatment		

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Mitigations are from corresponding numbered mitigation in the same document,
Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

SITE-SPECIFIC PROJECT MITIGATION

Site Name: Cooley Landing, San Mateo County

TSN: ISP-2004-16

<i>Impact*</i>	<i>Applicable Mitigation & Conservation Measures (source**)</i>	<i>Back-pack</i>	<i>Truck</i>	<i>Am-phibious Vehicle</i>	<i>Boat</i>	<i>Aerial</i>	<i>Implementation Timing</i>	<i>Verification Signatures</i>	
								<i>Implementing Entity</i>	<i>ISP Field Supervisor</i>
GEO-2: Erosion or topographic change of marsh and mudflat by vehicles used in eradication	Minimize vehicle use in marsh (GEO-2; CM-1)			X			During treatment		
WQ-1: Degradation of water quality due to herbicide application	Apply herbicide directly to plant at low tide and according to label. (WQ-1; CM-3 & 4)	X	X	X	X	X	During treatment		
WQ-2: Degradation of water quality due to herbicide spills	Apply under supervision of trained applicator (WQ-2;CM-3)	X	X	X	X	X	During treatment		
	Implement spill and containment plan provided by contractor and approved by WRA (WQ-2;CM-17)	X	X	X	X	X	During treatment		
WQ-3: Degradation of water quality due to fuel or petroleum spills	Implement spill and containment plan provided by contractor and approved by WRA (WQ-3;CM-17).	X	X	X	X	X	During treatment		
BIO-1.2: Effects on tidal marsh plant communities affected by Atlantic smooth cordgrass and its hybrids.	Minimize entry and re-entry into marsh (BIO-1.2;CM-1)	X	X	X	X	X	During treatment		

* Impact numbering from ISP Programmatic EIS/R, September 2003.

**Mitigations and control measures include ISP Programmatic EIS/R mitigations (e.g., BIO-1.2), U.S. FWS general biological opinion conservation measures (e.g., CM-3), U.S. FWS site-specific biological opinion conservation measures (e.g., SSCM-3), recommendations from U.S. FWS guidance letters (e.g., FWS GL), and California Department of Fish and Game recommendations (e.g., DFG).

Exhibit 1: April 24, 2008 Staff Recommendation

Impact*	Applicable Mitigation & Conservation Measures (source**)	Back-pack	Truck	Am-phibious Vehicle	Boat	Aerial	Implementation Timing	Verification Signatures	
								Implementing Entity	ISP Field Supervisor
	Avoid staging in high, dense vegetation such as gumplant or pickle-weed (FWS GL)	X	X	X	X	X	During treatment		
	Place mats or other protectors beneath heavy equipment operating in sensitive high marsh vegetation, especially gumplant (BIO-1.2)			X			During treatment		
	Avoid herbicide application to non-target vegetation adjacent to treatment area. (BIO-1.2;CM-3,4)	X	X	X	X	X	During treatment		
BIO-3: Effects on shorebirds, waterfowl & marshland birds.	Avoid working within 1,000 feet of occupied mudflats during peak Pacific Flyway stop-overs. (BIO-3)	X	X	X	X	X	During treatment		
	Occupy treatment area soon after high tide, before mudflats emerge. (BIO-3)	X	X	X	X	X	During treatment		
	Haze shorebirds to minimize potential direct contact with herbicide drift. (BIO-3)	X	X	X	X	X	During treatment		

* Impact numbering from ISP Programmatic EIS/R, September 2003.

**Mitigations and control measures include ISP Programmatic EIS/R mitigations (e.g., BIO-1.2), U.S. FWS general biological opinion conservation measures (e.g., CM-3), U.S. FWS site-specific biological opinion conservation measures (e.g., SSCM-3), recommendations from U.S. FWS guidance letters (e.g., FWS GL), and California Department of Fish and Game recommendations (e.g., DFG).

Impact*	Applicable Mitigation & Conservation Measures (source**)	Back-pack	Truck	Am- phibious Vehicle	Boat	Aerial	Implementation Timing	Verification Signatures	
								Implementing Entity	ISP Field Supervisor
BIO-5.1: Effects on California clapper rail.	For work within the Clapper Rail breeding season, call counts will be performed prior to application of herbicide according to FWS protocols (CM-18)	X	X	X	X	X	Pre-treatment		
	Provide CLRA Field biologist supervision. (BIO-5.1)	X	X	X	X	X	During treatment		
	Assure that field personnel are trained in general CLRA biology and CLRA identification and call detection. (BIO-5.1)	X	X	X	X	X	Pre-treatment and during treatment		
	Report any CLRA activity immediately to the on-site field biologist and in post-treatment report (BIO-5.1)	X	X	X	X	X	During and post-treatment		
BIO-5.3: Effects on tidal marsh song sparrow subspecies and the salt marsh common yellowthroat.	Report any SMSS and SCYE activity immediately to ISP Field Supervisor and in post-treatment report (BIO-5.3)	X	X	X	X	X	During treatment		
	Avoid spraying or removing Grindelia plants in the marsh	X	X	X	X	X	During treatment		

* Impact numbering from ISP Programmatic EIS/R, September 2003.

**Mitigations and control measures include ISP Programmatic EIS/R mitigations (e.g., BIO-1.2), U.S. FWS general biological opinion conservation measures (e.g., CM-3), U.S. FWS site-specific biological opinion conservation measures (e.g., SSCM-3), recommendations from U.S. FWS guidance letters (e.g., FWS GL), and California Department of Fish and Game recommendations (e.g., DFG).

Exhibit 1: April 24, 2008 Staff Recommendation

Impact*	Applicable Mitigation & Conservation Measures (source**)	Back-pack	Truck	Am- phibious Vehicle	Boat	Aerial	Implementation Timing	Verification Signatures	
								Implementing Entity	ISP Field Supervisor
	Watch for Song Sparrow presence in the work area during early season treatment work (pre-August), especially in the smaller, upper reaches of channels.	X	X	X	X	X	During and post-treatment		
BIO-5.4: Effects on California least terns and western snowy plovers.	Survey access levees for nesting CALT and WSPL prior to entry (BIO-5.4;CM-20)	X	X	X	X	X	Pre-treatment		
	Report any CALT and WSPL activity immediately to on-site field biologist and in post-treatment report (BIO-5.4)	X	X	X	X	X	During and post-treatment		
BIO-5.5:Effects on raptors (birds of prey)	Identified nests shall be provided a buffer of 500 feet during spray operations. (BIO-5.5)					X	During treatment		
BIO-6.1: Effects on anadromous salmonids (winter-run and spring-run Chinook salmon, steelhead).	Target herbicide applications to minimize herbicide use near channel. (BIO-6.1)	X	X	X	X	X	During treatment		
	Avoid use of alyphenol ethoxylate surfactants Dec 1 thru April 1 to avoid steelhead spawning. (BIO-6.1)	X	X	X	X	X	During treatment		

* Impact numbering from ISP Programmatic EIS/R, September 2003.

**Mitigations and control measures include ISP Programmatic EIS/R mitigations (e.g., BIO-1.2), U.S. FWS general biological opinion conservation measures (e.g., CM-3), U.S. FWS site-specific biological opinion conservation measures (e.g., SSCM-3), recommendations from U.S. FWS guidance letters (e.g., FWS GL), and California Department of Fish and Game recommendations (e.g., DFG).

Exhibit 1: April 24, 2008 Staff Recommendation

Impact*	Applicable Mitigation & Conservation Measures (source**)	Back-pack	Truck	Am-phibious Vehicle	Boat	Aerial	Implementation Timing	Verification Signatures	
								Implementing Entity	ISP Field Supervisor
BIO-6.4: Effects on estuarine fish populations of shallow submerged intertidal mudflats and channels.	Bio-6.4 – minimize spraying near intertidal mudflats and channels (BIO-6.4)	X	X	X	X	X	During treatment		
	Avoid use of alyphenol ethoxylate surfactants adjacent to channel to minimize any potential adverse affects on estuarine fish. (BIO-6.4)	X	X	X	X	X	During treatment		
AQ-1: Dust emissions	Suspend activities when winds are too great to prevent visible dust clouds from affecting sensitive receptors (i.e., houses, schools, hospitals). (AQ-1)	X	X	X	X	X	During treatment		
	Limit traffic speeds on any dirt access roads to 15 miles per hour. (AQ-1)	X	X	X	X	X	During treatment		
AQ-3: Herbicide effects on air quality	Implement ISP Drift Management plan for aerial applications of herbicide (AQ-3;CM-3,4)					X	During treatment		
N-1: Disturbance of sensitive receptors	Comply with local noise ordinances (N-1)	X	X	X	X	X	During treatment		
HS-2: Worker health effects from herbicide application.	Follow handling and application procedures as identified on product label. (HS-2;CM-3)	X	X	X	X	X	During treatment		

* Impact numbering from ISP Programmatic EIS/R, September 2003.

**Mitigations and control measures include ISP Programmatic EIS/R mitigations (e.g., BIO-1.2), U.S. FWS general biological opinion conservation measures (e.g., CM-3), U.S. FWS site-specific biological opinion conservation measures (e.g., SSCM-3), recommendations from U.S. FWS guidance letters (e.g., FWS GL), and California Department of Fish and Game recommendations (e.g., DFG).

Exhibit 1: April 24, 2008 Staff Recommendation

Impact*	Applicable Mitigation & Conservation Measures (source**)	Back-pack	Truck	Am- phibious Vehicle	Boat	Aerial	Implementation Timing	Verification Signatures	
								Implementing Entity	ISP Field Supervisor
HS-3: Health effects to the public from herbicide application.	Minimize drift according to drift management plan provided by contractor and approved by WRA. (HS-3;CM-3,4)	X	X	X	X	X	During treatment		
	Post appropriate signage within 24 hours of a treatment (HS-3;CM-3)	X	X	X	X	X	Pre-treatment		
	Avoid scheduling herbicide application near high public use areas during weekends or holidays, or close public access to area 24 hours before and after treatment. (HS-3;CM-3)	X	X	X	X	X	Pre-treatment and during treatment		
HS-4: Health effects to workers or the public from accidents associated with treatment.	Maintain Site Safety and Spill Prevention plan on site. (HS-4)	X	X	X	X	X	During treatment		
VIS-1: Alteration of views from removal of non-native Cordgrass Infestations.	Post appropriate signage according to ISP signage protocols. (VIS-1)	X	X	X	X	X	Pre-treatment, during treatment, post-treatment		
CUM-1: Effects of wetland restoration projects on spread of non-native cordgrass.	As approved by USFWS and required in RWQCB, BCDC, and Corps of Engineers permits, control of invasive cordgrass will continue at the project site until native vegetation has become established.	X	X	X	X	X	Pre-treatment and during treatment		

* Impact numbering from ISP Programmatic EIS/R, September 2003.

**Mitigations and control measures include ISP Programmatic EIS/R mitigations (e.g., BIO-1.2), U.S. FWS general biological opinion conservation measures (e.g., CM-3), U.S. FWS site-specific biological opinion conservation measures (e.g., SSCM-3), recommendations from U.S. FWS guidance letters (e.g., FWS GL), and California Department of Fish and Game recommendations (e.g., DFG).

Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

Cooley Landing Salt Pond: TSN: ISP-2004-16

<i>Impact*</i>	<i>Applicable Mitigation & Conservation Measures (source**)</i>	<i>Back-pack</i>	<i>Truck</i>	<i>Am-phibious Vehicle</i>	<i>Boat</i>	<i>Aerial</i>	<i>Implementation Timing</i>	<i>Verification Signatures</i>	
								<i>Implementing Entity</i>	<i>ISP Field Supervisor</i>
CM-7: Invasive species	Monitor cleared patches for recruitment of invasive plant species including perennial pepperweed until native vegetation has become dominant (CM-7)	X	X	X	X	X	Post-treatment		

* Impact numbering from ISP Programmatic EIS/R, September 2003.

**Mitigations and control measures include ISP Programmatic EIS/R mitigations (e.g., BIO-1.2), U.S. FWS general biological opinion conservation measures (e.g., CM-3), U.S. FWS site-specific biological opinion conservation measures (e.g., SSCM-3), recommendations from U.S. FWS guidance letters (e.g., FWS GL), and California Department of Fish and Game recommendations (e.g., DFG).

SITE-SPECIFIC PROJECT MITIGATION

Site Name: South San Francisco Bay Tidelands, Santa Clara County

TSN: ISP-2004-15

<i>Impact*</i>	<i>Applicable Mitigation & Conservation Measures</i>	<i>Herbicide</i>	<i>Implementation Timing</i>	<i>Verification Signatures</i>	
				<i>Implementing Entity</i>	<i>ISP Field Supervisor</i>
WQ-1: Degradation of water quality due to herbicide application	Apply herbicide directly to plant at low tide and according to label. (WQ-1;CM-3,4)	X	During treatment		
WQ-2: Degradation of water quality due to herbicide spills	Apply under supervision of trained applicator (WQ-2;CM-3)	X	During treatment		
	Implement spill and containment plan provided or approved by ISP (WQ-2;CM-17)	X	During treatment		
WQ-3: Degradation of water quality due to fuel or petroleum spills	Implement spill and containment plan provided or approved by ISP (WQ-3;CM-17)	X	During treatment		
BIO-1.2: Effects on tidal marsh plant communities affected by Atlantic smooth cordgrass and its hybrids.	Minimize entry and re-entry into marsh, define access points (BIO-1.2;CM-1)	X	During treatment		
	Avoid staging in high, dense vegetation such as gumplant or pickleweed (FWS GL)	X	During treatment		
	Avoid herbicide application to non-target vegetation adjacent to treatment area (BIO-1.2;CM-4)	X	During treatment		
BIO-3: Effects on shorebirds, waterfowl & marshland birds	Avoid working within 1,000 feet of occupied mudflats during peak Pacific Flyway stopovers (BIO-3)	X	During treatment		
	Occupy treatment area soon after high tide, before mudflats emerge (BIO-3)	X	During treatment		
	Haze shorebirds to minimize potential direct contact with herbicide drift (BIO-3)	X	During treatment		
BIO-4.1: Effects on the salt marsh harvest mouse and tidal marsh shrew species.	Use shortest possible access route through any pickleweed habitat. Flag areas of repeated access (BIO-4.1;CM-15)	X	During treatment		

*Impact numbering from ISP Control Program Programmatic EIS/R, September 2003.
Mitigations are from corresponding numbered mitigation in the same document,
Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

South Bay Marshes: TSN : ISP-2004-15

Impact*	Applicable Mitigation & Conservation Measures	Herbicide	Implementation Timing	Verification Signatures	
				Implementing Entity	ISP Field Supervisor
	Use protective mats or other covering over pickleweed in areas of repeated access (BIO-4.1;CM-15)	X	During treatment		
	Assume presence of SMHM on all suitable sites (CM 14)	X	During treatment		
	Whenever possible, schedule work after mass mortality events caused by extreme high tides (CM 16).	X	Pre-treatment		
BIO-4.2: Effects on resident harbor seal colonies of San Francisco Bay.	Minimize vehicle and foot access to marsh within 1000 feet of haul out sites (BIO-4.2)	X	During treatment		
	Avoid approaching haul out sites within 2000 feet (or any distance that elicits vigilance behavior) when pups are present. (BIO-4.2)	X	During treatment		
	Follow ISP spill prevention plan or equivalent BIO-4.2;CM-3,4)	X	During treatment		
BIO-5.1: Effects on California clapper rail.	Perform work only during Sept 1 thru Feb 1 to avoid CLRA breeding season (BIO-5.1;CM-18)	X	During treatment		
	Provide CLRA Field biologist supervision (BIO-5.1)	X	During treatment		
	Assure that field personnel are trained in general CLRA biology and CLRA identification and call detection (BIO-5.1)	X	Pre-treatment and during treatment		
	Report any CLRA activity immediately to ISP Field Supervisor and in post-treatment report (BIO-5.1)	X	During and post treatment		
BIO-5.3: Effects on tidal marsh song sparrow subspecies and the salt marsh common yellowthroat.	Report any SMSS and SCYE activity immediately to ISP Field Supervisor and in post-treatment report (BIO-5.3)	X	During and post-treatment		
	Avoid spraying or removing Grindelia plants in the marsh	X	During treatment		

*Impact numbering from ISP Control Program Programmatic EIS/R, September 2003.
Mitigations are from corresponding numbered mitigation in the same document,
Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

South Bay Marshes: TSN : ISP-2004-15

Impact*	Applicable Mitigation & Conservation Measures	Herbicide	Implementation Timing	Verification Signatures	
				Implementing Entity	ISP Field Supervisor
BIO-5.4: Effects on California least terns and western snowy plovers.	Survey access levees for nesting CALT and WSPL prior to entry (BIO-5.4;CM-20)	X	Pre-treatment		
	Report any CALT and WSPL activity immediately to ISP Field Supervisor and in post-treatment report (BIO-5.4)	X	During and post-treatment		
BIO-6.1: Effects on anadromous salmonids (Winter-run and spring-run Chinook Salmon, steelhead)	Herbicide treatments shall be minimized near channels and mudflats (BIO-6.1)	X	During treatment		
BIO-6.4: Effects on estuarine fish populations of shallow submerged intertidal mudflats and channels.	Minimize spraying near channels (BIO-6.4)	X	During treatment		
	Avoid use of alkyphenol ethoxylate surfactants adjacent to channel to minimize any potential adverse effects on estuarine fish (FWS BO)	X	During treatment		
AQ-1: Dust emissions	Suspend activities when winds are too great to prevent visible dust clouds from affecting sensitive receptors (i.e., houses, schools, hospitals). (AQ-1)	X	During treatment		
	Limit traffic speeds on any dirt access roads to 15 miles per hour. (AQ-1)	X	During treatment		
N-1: Disturbance of sensitive receptors	Comply with all local noise ordinances (N-1)	X	During treatment		
HS-2: Worker health effects from herbicide application.	Follow handling and application procedures as identified on product label (HS-2;CM-3,17)	X	During treatment		
HS-3: Health effects to the public from herbicide application.	Minimize drift according to ISP drift management plan (HS-3;CM-3,4,17)	X	During treatment		
	Post appropriate signage (see attached signage requirements) a minimum of 24 hours pre-treatment (HS-3)	X	Pre-treatment		
HS-4: Health effects to workers or the public from accidents associated with treatment.	Maintain ISP or approved equivalent Site Safety and Spill Prevention plan on site (HS-4;CM-3,4,17)	X	During treatment		

*Impact numbering from ISP Control Program Programmatic EIS/R, September 2003.
Mitigations are from corresponding numbered mitigation in the same document,
Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

Exhibit 1: April 24, 2008 Staff Recommendation

MITIGATION CHECKLIST

South Bay Marshes: TSN : ISP-2004-15

Impact*	Applicable Mitigation & Conservation Measures	Herbicide	Implementation Timing	Verification Signatures	
				Implementing Entity	ISP Field Supervisor
VIS-1: Alteration of views from removal of non-native cordgrass infestations.	Post appropriate signage according to ISP signage protocols (VIS-1)	X	Pre-treatment, during treatment, post-treatment		
CUL-1: Disturbance or destruction of cultural resources from access and treatment.	Report all discovered prehistoric or historic resources to the ISP Field Supervisor and a qualified archeologist or historic resources consultant and suspend all work at site until archaeological mitigation has taken place (CUL-1)	X	Pre-treatment and during treatment		
CUM-1: Effects of wetland restoration projects on spread of non-native cordgrass.	Potentially Significant-ISP and SCVWD will coordinate control work at site with the South Bay Salt Ponds Restoration Project.	X	Pre-treatment, During treatment, post-treatment		
CM-7: Invasive species	Monitor cleared patches for recruitment of invasive plant species including perennial pepperweed until native vegetation has become dominant (CM-7)	X	Post-treatment		

*Impact numbering from ISP Control Program Programmatic EIS/R, September 2003.
Mitigations are from corresponding numbered mitigation in the same document,
Also included are the USFWS general and site-specific biological opinions Conservation Measures (CM).

SITE 15: SOUTH BAY MARSHES COMPLEX, SANTA CLARA & SAN MATEO COUNTIES

This plan updates and appends the original site specific control plan for this site (Invasive *Spartina* Control Plan for South Bay Marshes, Santa Clara & San Mateo Counties, TSN: ISP-2004-15, 2005-2007 Control Seasons) dated May 2005. The original two sub-areas remain as defined in that plan, and one new sub-area has been added. There have been no new species or other significant environmental factors identified. The work described in this plan will continue and potentially complete the work initiated in 2004.

Site Partners

The work planned at this site will be implemented with grant funding provided by the State Coastal Conservancy directly to the project partners. The grant recipients for this site are:

California Wildlife Foundation, 1212 Broadway, Suite 840, Oakland, CA 94612; *Stephen Dunn, Administrator*, (510) 268-1828, sdunn@californiawildlifefoundation.org. The California Wildlife Foundation (CWF) is an independent 501(c)3 nonprofit organization founded in 1990 to support the programs of the California Department of Fish & Game and the Wildlife Conservation Board, with the mission of protecting the state's wildlife species and ensuring sustainable habitat as a public trust resource.

San Mateo County Mosquito Abatement District, 1351 Rollins Road, Burlingame, CA 94010; *James Counts, Field Operations Supervisor*, (650) 344-8592. james@smcmad.org. As the Coastal Conservancy grant recipient for the Faber Laumeister sub-area, SMCMD performed the treatment in 2007 on that site with their personnel and equipment. The marshes of San Mateo County are areas where the SMCMD regularly conducts mosquito control efforts, and control of the *Spartina* on these sites would potentially diminish the amount of mosquito breeding habitat available that the agency would need to monitor and treat for the insects.

Other Partners:

Santa Clara Valley Water District, 5750 Almaden Expressway, San Jose, CA 95118-3686; *Lisa Porcella*, (408) 265-2607 x 2741, lporella@valleywater.org. As a mitigation element of the SCVWD's Stream Maintenance Program, the SCVWD proposes to undertake a 5 year program of invasive *Spartina* monitoring and control of up to 10 acres of infestation in the South Bay. In 2003 the SCVWD conducted an extensive mapping and survey effort to identify non-native *Spartina* patches in South San Francisco Bay creeks, sloughs, and non-diked tide-lands. The SCVWD will provide the staff, equipment, and money for this project.

US Fish and Wildlife Service, Don Edwards National Wildlife Refuge, 1 Marshland Road, Fremont, CA, 94605; *Joy Albertson*, (510) 790-0222 x 31, joy_albertson@fws.gov. The Don Edwards National Wildlife Refuge (DENWR) recently acquired 10,000 acres of diked 'salt ponds' in the South Bay, which are slated for restoration to tidal marsh habitat in the coming years. Several of these ponds are directly adjacent to already invaded tidal marshes and are therefore at risk of future invasion themselves. The DENWR has implemented control programs on their properties in the past with moderate success, but with the addition of park territory and the increase in invasion pressure they will need assistance from adjacent landowners and managers to help control the threat. The DENWR will be providing consultation and coordination services to the Project.

City of Mountain View, Shoreline Regional Wildlife and Recreation Area, 3070 N. Shoreline Blvd. Mountain View, CA 94043. *Kristina Rockhold Senior Recreation Coordinator City of Mountain View* (650) 903-6070, Kris-tina.Rockhold@mountainview.gov. The City of Mountain View manages the large shoreline complex known as the Shoreline Regional Wildlife and Recreation Area, which includes large public facilities such as the Shoreline Amphitheatre, and shoreline open space, including tidal marsh areas such as Stevens Creek Marsh and Charleston Slough.

Site Description

Site 15: South Bay Marshes Complex includes the following sub-areas, which are shown in Attachment 3, "Spartina Control Site Maps":

- | | | | |
|-----|--|------|--|
| 15a | South Bay Marshes - Santa Clara County | 15c* | Shoreline Regional Park at Mountain View |
| 15b | Faber-Laumeister Marsh | | |

* Sub-area added since the 2005-2007 *Spartina* control plan

The areas covered in this site plan include the shoreline of the South Bay from Coyote Creek in the east, around the southern shoreline of the Bay clockwise to Faber-Laumeister Marsh in East Palo Alto in the west. Within this large area are many marshland habitat types, including restored salt ponds, tidal sloughs, creek deltas, fringing tidal marsh benches, open mudflats, historic tidal marsh plains and other habitat types. In Santa Clara County alone, over 100 miles of undulating shoreline make up the complex area covered in this plan. Much of the area has been developed for light industrial uses, but there are also public parks and trails along portions of the shoreline. Within the City of Mountain View, the Shoreline Regional Wildlife and Recreation area includes the Shoreline Amphitheater where thousands of concertgoers attend events year-round. Some of the marshland areas are inaccessible to the public, like the areas around the mouth of Coyote Slough which are owned by the US Fish and Wildlife Service as part of the San Francisco Bay Don Edwards National Wildlife Refuge.

The infestation of non-native *Spartina* in the South Bay is scattered amongst the sloughs, marshes and creeks of the entire shoreline. In the east, where Coyote Creek empties into the Bay, the infestation is very concentrated along the shoreline near the mouth, where new sediments have been deposited over the last few years. Small and large pioneering clonal patches are here interspersed with native *Spartina*. Also in this area is the infestation around the Knapp Tract, a soon to be restored salt pond system. This infestation has established within an existing native *Spartina foliosa* stand that lines the edges of the marsh. Here the morphologies of the hybrid *Spartina* present various characteristics intermediate to either of the parent plants. The area around the Knapp Tract represents the single largest concentration of non-native *Spartina* in this site.

The rest of the shoreline consists predominantly of scattered, individual clones of *Spartina* spread out along the sloughs and marsh edges that define this part of the Bay. Except in the case of the large infestation at Stevens Creek Marsh in Mountain View, these disparate clones represent a significant time commitment to access and treat, involving driving down long, convoluted levee systems. These infestations are, in general at a stable level as of winter 2007, though the infestation at Knapp Tract will continue to expand and export propagules off site if not comprehensively treated in 2008 and beyond.

Treatment Approach

The treatment approach for all sub-areas is described below.

SUB-AREA 15A: SOUTH BAY MARSHES, SANTA CLARA COUNTY

Sub-Area Partners

Owner(s): Santa Clara County
 Manager (s): Santa Clara County Public Works Agency
 Grantee(s): CWF

Sub-Area Description

The South Bay Marshes are located at the extreme southern tip of the San Francisco Bay, with both San Mateo and Alameda Counties bordering to the northwest and northeast, respectively. For the purposes of this plan, the area includes over 100 miles of shoreline, and encompasses some 1,750 acres of marshland. This highly diverse area includes extensive current and former salt ponds, restoration marshes, creek channels and sloughs, bay fill, large intact salt marshes, brackish marsh areas, slough edge marshes, pans, islands, mudflats, sand/shell beaches and other marsh habitats. Included within this area are Guadalupe Slough, Coyote Creek, Alviso Slough, Mountain View Slough and San Francisquito Creek. There is a high degree of complexity in the South Bay Marshes that will be enhanced significantly by the work of the South Bay Salt Ponds Restoration Project, which will convert sizable portions of former salt-making ponds to various types of marsh habitat.

Treatment along the shorelines of Santa Clara County has been done since 2004 by the Santa Clara Valley Water District. In 2004, the District worked along the Bay edge and along the sloughs throughout the area using both backpacks and truck-mounted spray equipment to apply glyphosate herbicide to individual scattered clonal patches found mostly along the southern shoreline of the Bay. Efficacy from these treatments was low, and the infestation in 2005 had grown from the levels observed in 2004.

In 2005 and 2006 the District again worked along the levees and shoreline of the large marshland area at the south end of the Bay, targeting the non-native *Spartina* found there with herbicide treatments. These treatments utilized imazapyr herbicide in place of glyphosate. The ISP and the Refuge also aided with selected aerial treatments at the mouth of Coyote Creek where ground-based treatment efforts were not used. The results from the ground-

based treatments were somewhat less than anticipated, but many of the treated areas did show a diminishment in the extent of the plants. Nevertheless, much of the area under the District's management was ripe for new colonization, and many new infestations were discovered and mapped by both the District and the ISP during that time.

In 2007, the District's applicators treated all known areas of non-native *Spartina* infestation accessible by ground and boat. The targeted aerial applications at the mouth of Coyote Creek were also repeated, though it was observed that the infestation there had increased as well since the previous year as a result of many new young plants. Final efficacy assessments of the work done in 2007 will be done in late spring or early summer 2008.

Many of the small, individual clonal patches along the shorelines of Santa Clara County have been significantly impacted by the work that has been done over the last four years. However, the majority of the small patches still support remnant sprigs of non-native *Spartina* that will require treatment in the coming seasons. All areas previously infested will need re-visiting for the foreseeable future.

In addition, new hybrid clones have grown up in existing patches of native *Spartina*, or adjacent to previously treated stands of non-native *Spartina*. An area of great concern is along the shoreline of the Knapp Tract on the southern shoreline of Coyote Creek, near the creek's mouth. This area has rapidly expanded over the last two seasons, and the infestation there has outpaced the ability of ground-based applicators to control effectively. The morphologies presented by the plants in the northeast and northern boundaries around Knapp Tract are diverse. Transect sampling of plant material for genetic analysis was conducted in autumn 2007 in this area, and the results showed a complex mix of cryptic hybrids throughout the area. Aside from Stevens Creek Marsh, discussed below, the areas around Knapp Tract represent the largest infestation in Santa Clara County.

Treatment Strategy, Methods, and Timing

Method: Imazapyr herbicide application

Equipment: Truck-mounted spray equipment
Backpack sprayers
Boats
Amphibious vehicles
Helicopters (aerial applications)

Timing: June-July start time for all herbicide treatments

Where accessible, the scattered Bay-edge infestations that pepper the shorelines of the marshes and sloughs within the Santa Clara County shoreline can be treated using backpacks and truck-mounted spray equipment, as has been done in the past. For discrete clonal patches that lie farther out on mudflats or within the marsh plain that are not bisected by deep channels, amphibious vehicles can be used to ferry equipment, materials and applicators to treatment locations, or to treat the clones directly with onboard spray equipment. Boats may also be used to access areas within the main channels or areas where there is no efficient or safe ground access to treatment areas.

In larger areas of infestation, like around the Knapp Tract area, aerial applications of imazapyr herbicide will be used. This method will be employed until the infestations there have been reduced to the extent that ground-based treatment options prove more efficient than aerial applications.

All treatments in the South Bay should be done as early as possible in the growing season. Previous applications in the area have had to wait until post-September 1st to access the marshes, and typical life-history for the *Spartina* in the South Bay has the plants flowering and setting seed at this time of year. Optimal treatment of these plants should occur from June through August, when the plants are actively growing and will more readily uptake herbicide for translocation through plant tissues. Without early season treatments, the infestations in this area will continue to expand, and eradication of the plants in this vulnerable and ecologically important area will not be possible.

Monitoring Requirements

As the infestations in this area have either been diminished as a result of treatments, or have newly expanded with a range of morphologies, detailed genetic analysis of the area will be necessary for some time to come. Especially around known centers of infestation, and selectively along previously uninfested areas, yearly genetic sampling of *Spartina* and the production of maps based on this data will be required for accurate control work. In the Knapp Tract area, yearly parallel transect sampling of the main areas of infestation will be necessary.

SUB-AREA 15B: FABER-LAUMEISTER MARSH*Sub-Area Partners*

Owner(s): US Fish and Wildlife Service
 Manager (s): US Fish and Wildlife Service
 Grantee(s): San Mateo County Mosquito Abatement District

Sub-Area Description

For the purposes of this plan, the area called Faber-Laumeister Marsh includes the marshlands along the shoreline of East Palo Alto from Bay Road at Cooley Landing south to San Francisco Creek. This roughly 210-acre complex of tidal marshlands is a remnant patch of a much larger historical marshland community, and maintains a high level of species diversity and habitat complexity. The area contains wide meadows of mixed marsh vegetation frequently broken up with sinuous small and large channels lined with dense hedges of *Grindelia stricta* and native *Spartina foliosa*. Large populations of the endangered California clapper rail inhabit this marsh, as well as the salt marsh harvest mouse.

The infestation at Faber-Laumeister marsh is limited to three relatively small clones. One is within the San Francisco Creek channel where it turns from an east-west orientation to a north-south orientation, a clone along the eastern levee system in the southern section of the marsh, and a clone along the northernmost channel in the southern portion of the marsh. The main marsh plain is otherwise uninfested.

Treatment Strategy, Methods, and Timing

Method: Imazapyr herbicide application
 Equipment: Backpacks for herbicide application
 Timing: June-August start-time for herbicide application

Treatment of the plants in this marsh will be relatively straightforward, with applicators walking the marsh to the target clones, using backpack sprayers to treat the plants. Access should be along the levees that border the marsh, and treatment should be done in June or July for the optimum efficacy.

Monitoring Requirements

As has been done in the past, yearly ISP inventory monitoring at this site utilizing GPS mapping will be required to identify the locations of clones in this marsh. Random genetic sampling of clonal patches within the marsh should be undertaken each year where field identification of native *Spartina foliosa* is in question.

SUB-AREA 15C: SHORELINE REGIONAL WILDLIFE AND RECREATION AREA AT MOUNTAIN VIEW*Sub-Area Partners*

Owner(s): City of Mountain View
 Manager (s): Shoreline Department of Parks and Recreation
 Grantee(s): CWF

Sub-Area Description

The City of Mountain View's Shoreline Regional Wildlife and Recreation Area includes several tidal sloughs, Bay-front tidal marsh habitat and restored tidal marsh areas. Two of the main marshes within this area are the Charleston Slough marsh and the Stevens Creek Marsh, both of which have infestations of non-native *Spartina*.

Charleston Slough is a 90-acre restored, formerly-diked salt evaporation pond on the western border of the Recreation Area. The marsh is almost entirely unvegetated with large central expanses of mudflat and channels being the defining features of this marsh. However, along the levee edges that delineate the boundaries of the marsh, scattered populations of marsh vegetation have begun to establish. These include patches of native and non-native *Spartina*, as well as other tidal marsh vegetation.

Stevens Creek Marsh, a smaller marsh at roughly 30 acres, is also a restored formerly diked salt pond, but Stevens Creek is highly vegetated. The marsh is located on the eastern end of the Recreation Area, at the Bayward end of the Stevens Creek Trail. The marsh has well-established populations of native tidal marsh plant species including broad meadows of native *Spartina foliosa*. Within this native matrix however, a sizeable population of non-native *Spartina* hybrids has been expanding over the last 3-5 years.

Treatment work at the Charleston Slough area has been done since 2005, with the Santa Clara Valley Water District spraying the few non-native plants that grew here with herbicide. In 2007, the work was taken up by CWF contracted crews. All areas within the Charleston Slough site have been treated using either backpack sprayers or truck-mounted spray equipment.

2007 was the first year of treatment in the Stevens Creek Marsh site. Crews worked along the levee edges using both backpack sprayers and truck-mounted spray equipment to treat all identified clones in the marsh. Imazapyr herbicide was applied to all plants, and the treatment occurred in late September when most of the plants had finished flowering and were going to seed.

The infestation at Charleston Slough was never large, and what remains after the several seasons of treatment is very stunted and limited to only a few locations in the marsh, especially along the western and northern edges. The plants here are grazed by shorebirds (geese perhaps) and though genetically identified as non-native *Spartina alterniflora* hybrids, are short and distinctly lacking in the typical hybrid vigor found in neighboring stands.

As 2007 was the first year of treatment on the Stevens Creek Marsh site, the infestation as of winter 2007 remains unchanged from its pre-treatment condition. At treatment in 2007, several dozen large clonal patches of variable morphologies were scattered throughout the marsh, and wide swaths of uniform stands of *Spartina* of unknown genotype dominated the marsh. All morphologically obvious clones were targeted in this marsh, and efficacy assessments of the treatments completed here will be done in late spring or early summer 2008.

Treatment Strategy, Methods, and Timing

Method: Imazapyr herbicide application

Equipment: Backpack sprayers
Truck-mounted sprayers
Amphibious vehicles
Helicopters
Boats

Timing: June start-time for herbicide application

Treatment along the shorelines of Charleston Slough can be readily done using either backpacks or trucks driving along the levees that line the marsh. Any non-native *Spartina* that is found within the wide mudflats in the center of the marsh will be more difficult to treat. Depending on the extent and location of any new clones on the interior, airboats or amphibious vehicles might be used to access the plants for treatment. As of winter 2007, there were no plants within the mudflat areas, let alone non-native *Spartina*.

At the Stevens Creek site, two parallel rows of power lines bisect the marsh lengthwise running north to south. As a result, aerial treatments here will be problematic if they can be done at all. Pilots who would be contracted to do the work will need to do pre-application ground reconnaissance of the site to assure that aerial treatments are possible on this site. Although aerial treatments at the Stevens Creek site would provide the most efficient treatment of this infestation, they may, in fact, not be possible here. As a result, continued use of ground-based treatment will be used, including backpacks, trucks and amphibious vehicles. All of these methods will be used to apply imazapyr herbicide applications to the target plants in the marsh. The use of boats in this particular marsh is not prescribed as the vegetation in this marsh is well developed and areas where a boat could readily navigate are few.

Monitoring Requirements

Both sites within the Recreation Area will require ground-based GPS mapping of the clones in the marsh. This effort will also need to include genetic sampling, as the plants along the shoreline of Charleston Slough are cryptic and difficult to discern morphologically, and the array of morphologies presented by the plants in Stevens Creek is substantial. Complete eradication of the non-native hybrids is the goal in both of these marshes, but Stevens Creek will require especially detailed mapping of the hybrid individuals in the marsh.

Environmental Compliance

Complete environmental compliance information, analyses, and mitigations were presented in the original control plan for this site (Invasive *Spartina* Control Plan for South Bay Marshes, Santa Clara & San Mateo Counties,

TSN: ISP-2004-15, 2005-2007 Control Seasons, May 2005), and are incorporated by reference into this update plan.

The original two sub-areas remain as defined in that plan, and one new sub-area has been added. The new sub-area is in the immediate vicinity of the existing sub-areas, and is extremely similar in physical and ecological character. There have been no new species or other significant environmental factors identified at the existing or new sub-areas.

Even with the addition of the new sub-area, the area of invasive *Spartina* slated for treatment in 2008-2010 is significantly less than the area treated in 2005-2007. As a result, any potential environmental impacts resulting from treatment are expected to also be less, and thus there are no new or increased impacts.

Updated Site-Specific Project Impact Evaluation and Site-Specific Project Mitigation checklists have been provided in Attachment 2.

SITE 08: PALO ALTO BAYLANDS, SANTA CLARA COUNTY

This plan updates and appends the original site specific control plan for this site (Invasive *Spartina* Control Plan for Palo Alto Baylands, Santa Clara County, TSN: ISP-2004-08, 2005-2007 Control Seasons) dated May 2005. The site boundaries remain as defined in that plan, and no new species or other significant environmental factors have been identified. The work described in this plan will continue and potentially complete the work initiated in 2005.

Site Partners

The work planned at this site will be implemented with grant funding provided by the State Coastal Conservancy directly to the project partner. The grant recipient for this site is:

City of Palo Alto, City of Palo Alto Baylands Nature Preserve, Open Space Division, 1305 Middlefield Road, Palo Alto, CA 94301; *Greg Betts*, Open Space Division Manager, (650) 463-4900. *Daren Anderson*, Baylands Senior Ranger, (650) 617-3156, daren.anderson@cityofpaloalto.org. The City of Palo Alto had contracted for some control work on this site prior to its partnership with the Coastal Conservancy's ISP, and had been involved with the monitoring and mapping for several years. Since 2005, they have contracted treatment work with private aquatic vegetation management firms with the Conservancy grant funding.

Other Partners:

Palo Alto High School, 50 Embarcadero Road, Palo Alto, CA 94301; *Lynn Hori*, Biology Teacher, (650) 329-3710 x 7352. For the past 7 years, students from Palo Alto High School, working in conjunction with the Naturalist for the Baylands, have monitored and mapped the spread of *Spartina* in the marsh and conducted other studies on this invasion, including covering as a treatment option, as well as aspects of the native marsh ecology.

Site Description

Site 08: Palo Alto Baylands is part of a 1,940 acre nature preserve and park complex, one of the largest tracts of undisturbed marshland remaining in San Francisco Bay, owned by the City of Palo Alto and located on the western bayfront approximately 2.5 miles south of the Dumbarton Bridge (see Attachment 3, "*Spartina* Control Site Maps"). The site is located east of Hwy. 101 at the end of Embarcadero Road, and includes those areas south of Faber-Laumeister Marsh and north of Charleston Slough. Within the site, Harriet Mundy Marsh is a peninsula vegetated with pickleweed (*Sarcocornia pacifica*), *S. foliosa*, and gumplant (*Grindelia stricta*) that extends out to Sand Point from the main parking area. There is a restored marsh cove to the southwest of the parking area that was once home to a yacht club before it was allowed to silt in and return to marshland. Hooks Island just offshore from Mayfield Slough is a pickleweed marsh with large areas of *S. foliosa* that have been colonized in recent years by large clones of alkali bulrush (*Bolboschoenus maritimus*). The park has high visitation on the 15 miles of established trails through the marsh, houses the Lucy Evans Baylands Nature Interpretive Center, and is a favorite spot for birdwatchers, naturalists, local schools, wind surfers, kayakers, anglers, bikers and runners.

Prior to the initiation of ISP treatment, this site was lightly infested with hybrid *S. alterniflora*, although a number of cryptic hybrids initially went undetected in certain areas due to access issues for collecting samples. The infestation was concentrated on inner Hooks Island and continuing south along the shoreline between Mayfield and Charleston Sloughs. There were also several patches in Harriet Mundy Marsh near the interpretive center. The site was treated by backpack sprayer in 2005, but although imazapyr was available to the contractor, they used the much less effective glyphosate, resulting in almost no efficacy. The City of Palo Alto switched to a new contractor in 2006, and they subsequently treated the hybrid *Spartina* with imazapyr using truck-mounted sprayers and long hoses hauled over the mud using large pieces of lumber. They treated the clones in the restored marsh south of the main parking area by backpack, and a single patch on the west tip of Hooks Island with a boat and backpack. The same contractor returned in 2007 and retreated with imazapyr where necessary using the same methods. Despite the relatively small infestation, the challenges of access and the widely scattered nature of the hybrid *Spartina* on this site necessitated two days to complete treatment.

The majority of the remaining *Spartina* is on inner Hooks Island and on the adjacent mainland shoreline across the Mayfield Slough channel, and many clones that were field identified as hybrid here turned out to be cryptic natives. A handful of scattered patches of hybrid area still present in the southern portion of the restored marsh,

and a new clone was discovered in a channel at the confluence of Matadero Creek and Mayfield Slough near the new levee road bridge. Approximately 2500 ft² of hybrid *Spartina* remains on the Palo Alto Baylands site.

Treatment Strategy, Methods, and Timing

Method:	Imazapyr treatment (primary)
Equipment:	Truck-mounted sprayer, backpack sprayer, lumber for crossing channel mudflat
Timing:	Treatment should occur between July 15 and September 1 Treat on a receding tide to maximize dry time for low elevation <i>Spartina</i> Annual beginning in 2008 until eradicated

This south bay site has always been treated in mid to late September, and the hybrid *Spartina* in this area tends to have started senescing by that time. The key to completing the eradication at this site is earlier timing, getting in by late July or early August, and conducting the work along Hooks Island on a receding tide to maximize dry time and efficacy. The work will be conducted using the same methods from 2006 & 2007, with a truck-mounted sprayer working in areas close enough to a truck staging area, and backpack sprayers for the scattered clones in the restored marsh.

Monitoring Needs

The appearance of the *Spartina* on Hooks Island is confusing, and warrants a more complete sampling and analysis of the genetics at the site. The monitoring crew may sample some side by side transects and provide the results to the contractor to inform treatment. Monitoring will continue until a minimum of three years of no non-native *Spartina* is reached.

Environmental Compliance

Complete environmental compliance information, analyses, and mitigations were presented in the original control plan for this site (Invasive *Spartina* Control Plan for Palo Alto Baylands, Santa Clara County, TSN: ISP-2004-08, 2005-2007 Control Seasons, May 2005), and are incorporated by reference into this update plan.

The site boundaries remain as defined in that plan, and no new species or other significant environmental factors have been identified. Because the area of invasive *Spartina* slated for treatment in 2008-2010 is significantly less than the area treated in 2005-2007, any potential environmental impacts resulting from treatment are expected to also be less, and thus there are no new or increased impacts.

Updated Site-Specific Project Impact Evaluation and Site-Specific Project Mitigation checklists have been provided in Attachment 2.

SITE 02: BAIR & GRECO ISLANDS COMPLEX, SAN MATEO COUNTY

This plan updates and appends the original site specific control plan for this site (Invasive *Spartina* Control Plan for Bair & Greco Islands Complex, San Mateo County, TSN: ISP-2004-02, 2005-2007 Control Seasons) dated May 2005. The original 10 sub-areas remain as defined in that plan, and three new sub-areas have been added. There have been no new species or other significant environmental factors identified. The work described in this plan will continue and potentially complete the work initiated in 2004.

Site Partners

Part or all of the work planned at this site will be implemented with grant funding provided by the State Coastal Conservancy directly to one or more project partner. The grant recipients for this site are:

The U.S. Fish and Wildlife Service, Don Edwards National Wildlife Refuge, 5 Marshland Road, Fremont, CA 94564; *Joy Albertson*, (510) 792-0222 x 35. Don Edwards National Wildlife Refuge (DENWR) owns and manages the Bair & Greco Island Complex, as well as many thousands of additional acres of marsh, both invaded and uninvaded by *Spartina*, throughout the South and Central Bay. DENWR also owns tens-of-thousands of acres of currently diked, former salt ponds, which are slated for restoration to tidal marsh in coming decades, and which would be vulnerable to *Spartina* infestation. The DENWR has implemented a control program on their properties over the last several years.

San Mateo County Mosquito Abatement District, 1351 Rollins Road, Burlingame, CA 94010; *James Counts*, *Field Operations Supervisor*, (650) 344-8592. The San Mateo County Mosquito Abatement District (SMCMAD) has been working in the area since 1953, and has extensive knowledge of, equipment for, and expertise relating to the specific requirements necessary for safe control work within this marsh environment. SMCMAD implemented the *Spartina* control work on this site last year, and several of the sub-areas outlined in this plan are areas where the SMCMAD regularly conducts mosquito control efforts. Control of the *Spartina* on these sites would allow for restoration of these areas to natural tidal influences and thus diminish the amount of mosquito breeding habitat available.

Site Description

Site 02: Bair and Greco Islands Complex includes the following sub-areas, which are shown in Attachment 3, “*Spartina* Control Site Maps”:

02a	Belmont Slough/Island, North Point, Bird Island, Steinberger Slough/ Redwood Shores	02g	West Point Slough Southwest and East
02b	Steinberger Slough South, Corkscrew Slough, Redwood Cr North	02h	Greco Island South
02c	Pond B2 North Quadrant	02i	Ravenswood Slough & Mouth
02d	Pond B2 South Quadrant - Rookery	02j	Ravenswood Open Space Preserve
02e	West Point Slough Northwest	02k*	Redwood Creek & Deepwater Slough Restoration
02f	Greco Island North	02l*	Inner Bair Island Restoration
		02m*	Pond B3: Middle Bair Island Restoration

* Sub-area added since the 2005-2007 *Spartina* control plan

The Bair & Greco Island complex encompassed by this plan is located in the southwest portion of the San Francisco Bay Estuary. The northern edge of the complex is at Belmont Slough on the border of Foster City and Redwood City, including the marshes of Brewer Island just south of the San Mateo Bridge. The southern border of the complex is the Union Pacific railroad line just south of the Dumbarton Bridge. The site is a 3,060-acre complex including marsh islands, active and inactive commercial salt ponds, six large sloughs with numerous smaller channels, and other bayfront marsh that is part of the San Francisco Don Edwards National Wildlife Refuge (DENWR).

The Bair & Greco Island complex contains many different marsh systems, all of which are impacted to varying degrees by *S. alterniflora* hybrids. Of the roughly 3,060 acres of baylands within the complex, there are approximately 116 acres infested with non-native *Spartina*. Below are brief descriptions of the non-native *Spartina* growth in each sub-area.

Treatment Approach

The treatment approach for all sub-areas is described below. Where possible, sub-areas with significant similarities have been grouped together.

SUB-AREAS 02A, 02B, 02C, AND 02D: BELMONT SLOUGH/ISLAND, NORTH POINT, BIRD ISLAND, STEINBERGER SLOUGH/REDWOOD SHORES, STEINBERGER SLOUGH SOUTH, CORKSCREW SLOUGH, REDWOOD CREEK NORTH, POND B2 NORTH QUADRANT, AND POND B2 SOUTH QUADRANT-ROOKERY

Sub-Area Partners

Owner(s): CDFG, USFWS
 Manager (s): CDFG, USFWS
 Grantee(s): USFWS, SMCMA

Sub-Area Description

Belmont Slough/Island, North Point, Bird Island, and the northern bank of Steinberger Slough along Redwood Shores represent a 448-acre portion of this sub-area. The sloughs are open tidal waters lined with strips of mixed native pickleweed/*Spartina foliosa* marsh. The shorelines and islands are comprised of thin to moderate-width open mudflats grading into native *Spartina* marsh, with some pickleweed/gumplant (*Grindelia stricta*) marsh at higher elevations. All sloughs and marshes are bordered by levees topped by access roads or the Bay Trail. Residential and recreational areas border both the Steinberger and Belmont Sloughs just inland of the levees.

The southern shore of Steinberger Slough to the mouth, both banks of Corkscrew Slough, and the marshes and shoreline on the northern shore of Redwood Creek is an 894-acre portion of this sub-area. This is part of the Bair Island Restoration and Enhancement Project managed by USFWS. The sloughs are open tidal waters lined with strips of native *Spartina foliosa* marsh. The shorelines and adjacent marshes are comprised of thin bands of open mudflats grading into native *Spartina* marsh, with some pickleweed/gumplant marsh at higher elevations. Portions of the sloughs are bordered by levees, some with access roads, but the adjacent areas are part of the habitat restoration project, and are typically not accessible to the public.

The B2 North Quadrant is a 541-acre, formerly diked area on the northern section of Outer Bair Island, adjacent to Steinberger Slough. This area is also part of the Bair Island Restoration and Enhancement Project. The levees surrounding the area were naturally breached, and tidal marsh has begun to restore. The site is predominantly pickleweed/gumplant habitat, with native *Spartina* marsh in lower areas and along sloughs. The levees surrounding the site area are deteriorated and there is no public access.

The B2 South Quadrant - Rookery, also part of the Bair Island Restoration and Enhancement Project, is a 61.7-acre diked area adjacent to the B2 North Quadrant. This site is being “restored” as seasonal wetland habitat, and is currently dominated by invasive *Spartina*. The levees surrounding the site are intact, but there is no public access.

Portions of this large group of sites have been targeted for treatment since 2004. In that year, the San Mateo County Mosquito Abatement District (SMCMAD) worked predominantly in the Pond B2 South area, targeting the *Spartina* there with glyphosate herbicide treatments. At the time this area was one of the largest single concentrations of non-native *Spartina* in the Bair and Greco Island Complex. Efficacy from the glyphosate treatments was low however. Partially as a result of the export of seed from B2, and partially a result of expansion of the smaller infestations already present, the adjacent infestations in Steinberger and Belmont Sloughs, as well as in Pond B2 North, dramatically expanded.

By 2005, the areas within both the North and South Quadrants of Pond B2, along with the shorelines of Belmont and Steinberger Sloughs had developed sizeable infestations. In the sloughs, the native tidal salt marsh vegetation that lines the banks was being displaced by widely scattered clonal patches of non-native hybrid *Spartina* throughout the lengths of their respective channels. In Belmont Slough, the infestation extended to the west even to HWY-101, in a small marsh called O’Neill Slough. In Steinberger Slough, the infestation was similar on the north side, with scattered clonal patches in amongst the native vegetation.

Within Bair Island however, the infestation had exploded, particularly within Pond B2 North, where ample open mudflat areas offered prime colonization habitat for the vigorous non-native hybrid *Spartina* propagules that found their way there. Pond B2 South maintained its near-monoculture, showing very little impact from the previous year’s treatment work.

Pond B2 was treated aerially via helicopter in 2005, utilizing imazapyr herbicide for the first time. Many of the other areas in this group of sites were treated as well, but only via ground or boat-based treatment methods. Pond B2 North was only partially treated. Typical of first-year treatment with imazapyr on established *Spartina* stands, the efficacy observed from these applications was less than anticipated. Nevertheless, in 2006, some diminishment of the infestation in B2 South, and some impact to the clonal patches along the slough edges were discernable.

In 2006, large-scale aerial applications of imazapyr herbicide were adopted for Pond B2 both north and south, as well as along the southern banks of Steinberger Slough and at selected spots within Corkscrew Slough. Additionally, the SMCMAAD mounted the most comprehensive ground and water-based treatment efforts to date, targeting all of the non-native *Spartina* within these four sites that had not been treated aerially. By 2007, the aerial work showed marked results, with large swaths of the previously monocultural expanse of *Spartina* within B2 dead. Good efficacy was also observed along the banks of the sloughs, though some clonal patches remained.

In 2007, the aerial effort was repeated within B2 North and South, and along the banks of Corkscrew and Steinberger. Again the SMCMAAD mounted a comprehensive effort along all other infested areas within these four sites. Efficacy assessments on these treatment efforts will occur in late spring or early summer 2008.

As of winter 2007, the infestations within this broad area are in various stages of control. In both of the B2 Ponds, north and south, the previous seasons' aerial treatments have resulted in significant reduction of the infestations in these marshes. What remains here are small patches both within the marsh plain and along channels, but very few of the remaining plants are wholly untouched by treatment. The patches here are scattered and unconnected, whereas previously they were solid, monocultural stands.

Along the northern channel banks of Steinberger Slough, the large clones that previously dotted the marsh plain have been almost completely removed. However, new small clones have sprouted here and represent the main portion of the infestation requiring treatment in 2008 and beyond. Additionally, scattered survivors remain from previous treatments within the footprint of the large clonal patches. These remnant individuals will also be a high priority for treatment going forward. This condition is similar to that of Corkscrew Slough, wherein scattered remnant patches, much diminished from pre-treatment condition, can be found along the channel. Few in number, they still represent a high priority for the ISP as part of the eradication effort in the area.

On the southern side of Steinberger, the best control has happened along the northern shoreline of Pond B2 North, where aerial treatments have almost completely removed the non-native *Spartina* from the area. Only a few remnant patches remain that will require treatment in 2008. However, south of B2 North, along the banks of Steinberger towards HWY-101, the infestation continues to thrive as a dense monocultural band along the southern shoreline of Pond B3 (Middle Bair). This particular area will require targeted control work in 2008 and beyond to remove the plants from the area, as restoration work at B3 aims to breach the levee through a thriving stand of non-native *Spartina*.

Belmont Slough remains a significant problem area. Areas of special concern are the northern banks of the slough, and the upper end of the slough near O'Neill Slough. At the mouth of the slough, south toward Bair Island, control has been spotty. All of these areas have numerous large clonal patches in need of treatment in 2008.

Treatment Strategy, Methods, and Timing

Method: Imazapyr herbicide application

Equipment: Amphibious Vehicles
Truck-mounted spray equipment
Backpacks
Boats
Helicopter

Timing: June-July start time for ground-based and aerial treatments

Treatment efforts on these sites will basically follow the efforts done in previous seasons, especially in 2008, to the extent that the on the ground efficacy assessments of the 2007 treatment season dictate need. Aerial treatments will be done along the south side of Steinberger and within B2 North and South, and boats, trucks, backpacks and amphibious vehicles will be used where appropriate on all other areas. As the infestations diminish over subsequent seasons, it may become possible to do the work solely via ground and boat-based methods.

Monitoring Needs

The infestations within these sites require ground-based surveys using GPS equipment. In Pond B2 North and South, the infestations have typically been mapped using 'heads-up' digitization, wherein the extent of the infestation is mapped on GIS software in the office using orthophotos of the site and then ground-truthed. This method will no longer suffice to identify the clonal areas within B2 that remain from the previous treatment efforts at the site.

SUB-AREAS 02E, 02F, 02G AND 02H: WEST POINT SLOUGH NW, GRECO ISLAND NORTH, WEST POINT SLOUGH SW AND EAST, AND GRECO ISLAND SOUTH*Sub-Area Partners*

Owner(s): USFWS
 Manager (s): USFWS
 Grantee(s): USFWS, SMCMA

Sub-Area Description

This grouping of four sites within the Bair and Greco Island Complex essentially encompasses the marshland areas to the south of Redwood Creek to just north of the mouth of Ravenswood Slough. This area consists of Greco Island and West Point Slough, both of which were divided into two sub-areas previously. As these areas are all treated by SMCMA during the course of the treatment season, and essentially are contiguous linked habitat, they have been combined for this Site-Specific Plan update.

West Point Slough NW is a 21-acre sub-area that includes both banks of the north end of West Point Slough, up to Redwood Creek, and a portion of the shoreward side of Greco Island. The slough consists of open tidal waters lined with strips of native *Spartina* marsh. The included portion of Greco Island is that portion of the island to the southwest of the PG&E power line maintenance boardwalk that bisects Greco Island. There are intact levees on the western edge of the slough, with an office park (primarily parking lot) and light industrial site inboard of the levees. Besides the light public usage of the accessible features, there is little public access to most of this area. Much of the developed shoreline on the northern portion of this sub-area is lined with rip-rap and fill.

Greco Island is reported to be the largest remaining prehistoric tidal marsh in the South Bay. The Greco Island North sub-area is 556 acres, with the eastern shore (bayfront) comprised of wide mudflats, many small sloughs lined with native *Spartina* marsh, and pickleweed/gumplant marsh at higher elevation. There is a power line right-of-way running the length of the island, but there is no public access to the site.

West Point Slough SW and East is an 87.2-acre sub-area that includes the southern end of West Point Slough around the end of Greco Island, and Flood Slough near Bayfront Park. West Point Slough becomes very narrow at the southern end, and densely vegetated with primarily invasive *Spartina*. A small wastewater treatment plant is located at the confluence of West Point and Flood Sloughs, adjacent to Bayfront Park. Bayfront Park is a moderately used public park located on hills and uplands overlooking the sloughs.

The 261-acre Greco Island South sub-area includes the southern lobe of Greco Island at the mouth of West Point Slough. The marsh in this area is similar the northern part of Greco Island (Sub-area 02f), except that it merges with portions of West Point Slough, and may have unique access issues due to the presence of a PG&E power line maintenance boardwalk across the marsh. There is no public access at this site.

SMCMA has treated all four of these areas since 2005. The majority of the Greco Island South area has been treated with imazapyr via helicopter broadcast applications, whereas the areas along West Point Slough have been targeted with both boats and via trucks and backpacks. Each successive year has seen the infestations in these areas decrease, especially in 2007.

As of winter 2007, the mudflat areas to the south of Greco Island still support clonal patches of non-native *Spartina* that are detached from the main marsh adjacent. Although the bulk of the infestation at Greco Island has been significantly reduced, a sizeable population of non-native *Spartina* exists on the northeastern Bay-side portion of the marsh where the PG&E power lines run along the shore. Additionally, West Point Slough is an area of continued concern, as the population of hybrid *Spartina* here has maintained a presence despite repeated attempts at control. This particular area will require concentrated effort in the coming years to reduce and remove the remaining stands of non-native *Spartina* scattered along the shoreline.

Treatment Strategy, Methods, and Timing

Method:	Imazapyr herbicide application
Equipment:	Helicopter: broadcast aerial Truck-mounted spray equipment Amphibious vehicles Boats Backpacks
Timing:	Mid-July start time for both aerial and ground-based treatments

The infestations within this four-site area will be treated with a combination of aerial and ground and boat-based treatment methods similar to the approach over the past three control seasons. Greco Island and some parts of West Point Slough are appropriate targets for final aerial applications in 2008 as long as the infestations in those areas remain large enough to justify this method. Some of the areas around Greco also might warrant aerial applications by dint of the difficulty of access via any ground or water-based method. Otherwise, crews working along the shoreline in both trucks and boats or via amphibious vehicles will target all of the newly establishing and remnant plants in this area.

Monitoring Needs

As in other areas, the main areas of infestation in this area will require detailed GPS-based ground assessments of the locations of the non-native *Spartina*. This is especially the case as there are large populations of native *Spartina* within the sites. Additionally, comprehensive genetic surveys of Greco Island will need to be completed each year to determine the distribution and extent of the hybrid forms in this marsh.

SUB-AREAS 02I AND 02J: RAVENSWOOD SLOUGH AND MOUTH AND RAVENSWOOD OPEN SPACE PRESERVE*Sub-Area Partners*

Owner(s):	USFWS
Manager (s):	USFWS
Grantee(s):	USFWS, SMCMA

Sub-Area Description

The Ravenswood Slough and Mouth site is a roughly 136-acre sub-area including both shores of Ravenswood Slough to its mouth, and the Bay shoreline to Ravenswood Point, with expansive mudflats along the Bay shoreline adjacent to the site. The slough is open tidal water lined with wide, accreted benches covered with native *Spartina* marsh. The slough is entirely bordered by levees, with commercial salt ponds inland of the dikes. There is no public access to this site.

For the purposes of this plan, the Ravenswood Open Space and Preserve consists of the 55-acre stretch of rip-rap and fringing strip marsh south of the Dumbarton Bridge (Hwy 84) outboard of the commercial salt pond known as "Pond SF2." The marsh is bordered by levees and is heavily used by the public for recreational purposes.

These two areas have been targeted for comprehensive *Spartina* treatment since 2005. SMCMA has used boats, helicopters and amphibious vehicles to move through the fringing marsh edges of the slough and along the Bay shoreline at these two sites, and apply imazapyr herbicide to the target plants. The largest portion of the infestation in these areas is located within the channel of Ravenswood Slough, especially on the west side. This is an area of significant native marsh development, and the plants have been largely located on the lower edges of the marsh, straddling smaller channels next to the main channel. In this area, amphibious vehicles would deploy from the adjacent levee to treat the plants.

In 2007 both of these areas were targeted for aerial applications, whereas the Bay shoreline areas were again targeted using amphibious vehicles. 2007 saw the treatment of the entire infestation in this part of the Bair and Greco Island Complex.

As of winter 2007, the main contours of the infestation remained unchanged, wherein scattered remnant clonal patches persist within the Ravenswood Slough Channel, at its mouth, and southeast along the shoreline. However, some of these areas had not been previously treated via helicopter, and given the propensity for aerial applications to result in much higher and more consistent efficacy than any ground-based method, there is a high likelihood

that the infestation in these areas will have significantly diminished come late spring or early summer 2008 efficacy assessments in the area.

Treatment Strategy, Methods, and Timing

Method: Imazapyr herbicide application

Equipment: Helicopter: Broadcast aerial

Truck-mounted spray equipment

Amphibious vehicles

Boats

Backpacks

Timing: Mid-July start time for aerial and ground-based treatments

Treatment in these two areas will follow the treatment work done previously on the sites. Where appropriate levels of non-native *Spartina* remain, broadcast aerial applications of imazapyr herbicide will be used. For the rest of the site, and into the coming control seasons, boats, trucks and amphibious vehicles will selectively target the individual remaining stands of non-native *Spartina* in the marsh.

Monitoring Needs

This site will require, as has been done in the past, ground-based GPS surveys of the plants along the channel as part of normal yearly inventory monitoring, especially as the infestation dwindles further and becomes more scattered. Genetic sampling of the plants within Ravenswood Slough should also be increased, as this area has a large population of native *Spartina* mixed within the non-native *Spartina* stands.

SUB-AREA 02K: REDWOOD CREEK AND DEEPWATER SLOUGH RESTORATION

Sub-Area Partners

Owner(s): USFWS, CDFG, Port of Redwood City

Manager (s): USFWS, Port of Redwood City

Grantee(s): USFWS, SMCMA

Sub-Area Description

This site includes the areas along the shoreline of Redwood Creek in Redwood City. The area is defined by the southeastern shoreline of Bair Island and the Port of Redwood City and Greco Island. Included within this area is the Deepwater Slough Restoration area, a roughly 155-acre site on the southeastern side of Bair Island, to the south of Corkscrew Slough. This area also includes the Port of Redwood City facilities, especially the Redwood City Marina. This area has a wide variety of habitats, from rip-rap developed shoreline to restored tidal marsh, to industrial facilities to historic native tidal marsh systems. The *Spartina* infestation here is spread amongst several main locations, including the Marina, Deepwater Slough and the shorelines of both Bair and Greco Islands. Other smaller patches can be found upstream of the Marina, as well as throughout the site.

The Deepwater Slough Restoration area, as well as the shoreline of Bair Island along Redwood Creek, have both been treated with imazapyr since 2005 with a combination of aerial applications and boat-based applications. The aerial portion of treatment was done in combination with the treatment of adjacent stands of non-native *Spartina*, and did not encompass the entirety of the infestation in either area. Follow-up work was done via boat by SMCMA to target those areas missed by aerial treatments. In 2007, these boat-based efforts were extended upstream to include the areas around the Marina as well as the areas toward Inner Bair Island. These areas were treated with imazapyr herbicide by a combination of truck and boat applications.

As of winter 2007, clonal patches of non-native *Spartina* remained at all locations within this site: in the Marina, along the eastern shoreline of Redwood Creek, along the shoreline of Bair Island, and within the Deepwater Slough Restoration. All of these areas will require re-treatment in 2008 and beyond. However, the areas within Deepwater Slough have been treated for at least two years, and do show signs of being controlled. Final efficacy assessments will be done in the late spring or early summer of 2008, and control work will proceed according to the results.

Treatment Strategy, Methods, and Timing

Method: Imazapyr herbicide application

Equipment: Helicopter: Broadcast aerial
Truck-mounted spray equipment
Amphibious vehicles
Boats
Backpacks

Timing: Mid-July start time for aerial and ground-based treatments

Treatment in this area have been typically done with a combination of early season aerial applications on a select few sites in the Deepwater Slough area and out along the southeastern shoreline of Bair Island to the northeast of Corkscrew Slough, followed later in the year with ground and boat-based treatments along the rest of the shoreline. Treatments in 2008 and beyond will follow a similar strategy, with the need for aerial treatments diminishing as the size of the infestations shrinks. Areas where there will continue to be difficulty in regards to access may continue to warrant aerial applications in combination with aerial work done on adjacent sites. However the bulk of the work in future years will be done on the ground, especially around the marina area.

Monitoring Needs

This site will require, as has been done in the past, ground-based GPS surveys of the plants along the channel as part of normal yearly inventory monitoring, especially as the infestation dwindles and becomes more scattered. Additionally, the areas within the Deepwater Slough area will require genetic sampling and analysis to identify those non-native hybrid individuals that remain in this portion of the marsh.

SUB-AREA 02L: INNER BAIR ISLAND RESTORATION

Sub-Area Partners

Owner(s): USFWS
Manager (s): USFWS
Grantee(s): USFWS, SMCMA

Sub-Area Description

The Inner Bair Island Restoration marsh is a roughly 327-acre diked marsh area along the shoreline of Redwood City, between the northeastern termini of Brittan and Whipple Avenues. The marsh is currently not open to tidal exchange, but the periphery of the main marsh area contains a thin band of tidal marsh vegetation. The site is slated to be opened to tidal exchange in the next few years.

The clonal patches on the southwestern corner of the site, in a small slough area that bounds the marsh proper to the south and west, are only a few in number. These clones were treated by SMCMA in 2007 via imazapyr by boat. As of winter 2008, the clonal patches near the Whipple interchange remain standing. Efficacy assessments of the work done in 2007 will occur in late spring or early summer 2008.

Treatment Strategy, Methods, and Timing

Method: Imazapyr herbicide application
Equipment: Truck-mounted spray equipment
Amphibious vehicles
Boats
Backpacks

Timing: Mid-July start time

The infestation in the Inner Bair Island site is currently very small, and limited to a couple of areas along the southwestern portion of the marsh. Treatment of these areas is relatively straightforward, involving the use of boats to ferry equipment, applicators and materials to the plants for treatment.

However, once the main marsh area is opened to tidal exchange, the infestation may begin to colonize that area, and will require the use of other methods like amphibious vehicles and trucks to effectively treat the infestation.

Monitoring Needs

This site will require, as has been done in the past, ground-based GPS surveys of the plants along the channel as part of normal yearly inventory monitoring, especially as the infestation dwindles and becomes scattered. As at

the Pond B3 site on Bair Island, once the main marsh area is opened to tidal exchange, yearly genetic sampling of all newly establishing plants in the marsh will be required. This analysis will inform control efforts, as there is a large, healthy population of native *Spartina* in the area. Yearly sampling of the *Spartina* in this marsh will enable the ISP and its partners to specifically target the non-native *Spartina* while allowing the native colonizers to establish and flourish.

SUB-AREA 02M: POND B3- MIDDLE BAIR ISLAND RESTORATION

Sub-Area Partners

Owner(s): USFWS
 Manager (s): USFWS
 Grantee(s): USFWS, SMCMA

Sub-Area Description

The Pond B3: Middle Bair Island Restoration is a roughly 400-acre diked salt pond in the northern portion of Bair Island. It is bordered to the southwest by Corkscrew Slough, to the northwest by Steinberger Slough, and in the northeast by Pond B2 North. Currently the marsh is not open to tidal exchange, and within the levees that surround the marsh is long-dead salt marsh vegetation and channels with stagnant water.

The areas of the levees that are targeted for breaching in 2008 or 2009 are located directly within existing stands of non-native *Spartina*. Natural colonization of this marsh may result in the importation of non-native *Spartina* propagules. However, the infestations that surround the marsh are included in a comprehensive treatment effort, and the density and location of the remaining non-native *Spartina* patches at breaching cannot be known at this time.

No non-native *Spartina* treatment has occurred at this site. Currently there is no non-native *Spartina* established at the site. Breaching of the levee system bordering the site will occur in 2008 or 2009, and the proposed locations of the breaches will cut through currently existing infestations of non-native *Spartina*. The potential for an infestation establishing in this site once it is subjected to normal tidal fluctuation will be great.

Treatment Strategy, Methods, and Timing

Method: Imazapyr herbicide application
 Equipment: Helicopter: Broadcast aerial
 Truck-mounted spray equipment
 Amphibious vehicles
 Boats
 Backpacks

Timing: Mid-July start time for aerial and ground-based treatments

The methods of control identified above are designed to encompass the possible infestation scenarios that might develop at the site once normal tidal exchange is restored. The use of any of these methods will be evaluated based on the size and location of the newly established infestation in the marsh. Aerial applications will be used should the infestation grow larger than ground based treatment methods can efficiently control, or should the infestation be located in areas that are inaccessible to any other control method.

Monitoring Needs

SMCMAD will work with the ISP to monitor the site post-breaching to quickly identify newly-establishing hybrid *Spartina* plants within the marsh. As native and non-native *Spartina* seedlings are virtually indistinguishable, this monitoring effort should, at least in the first couple of years following restoration, rely heavily on the use of genetic analysis. For the first two years, all newly establishing plants should be sampled and tested. All individual *Spartina* plants should also be mapped using GPS equipment to identify the native vs. non-native areas of the marsh.

Environmental Compliance

Complete environmental compliance information, analyses, and mitigations were presented in the original control plan for this site (Invasive *Spartina* Control Plan for Bair & Greco Islands Complex, San Mateo County, TSN: ISP-2004-02, 2005-2007 Control Seasons, May 2005), and are incorporated by reference into this update plan.

The original 10 sub-areas remain as defined in that plan, and three new sub-areas have been added. The three new sub-areas are in the immediate vicinity of the existing sub-areas, and are extremely similar in physical and ecological character. There have been no new species or other significant environmental factors identified at the existing or new sub-areas.

Even with the addition of the new sub-areas, the area of invasive *Spartina* slated for treatment in 2008-2010 is significantly less than the area treated in 2005-2007. As a result, any potential environmental impacts resulting from treatment are expected to also be less, and thus there are no new or increased impacts.

Updated Site-Specific Project Impact Evaluation and Site-Specific Project Mitigation checklists have been provided in Attachment 2.

SITE 16: COOLEY LANDING SALT POND RESTORATION, SAN MATEO COUNTY

This plan updates and appends the original site specific control plan for this site (Invasive *Spartina* Control Plan for Cooley Landing Salt Pond Restoration, San Mateo County, TSN: ISP-2004-16, 2005-2007 Control Seasons) dated May 2005. The site boundaries remain as defined in that plan, and no new species or other significant environmental factors have been identified. The work described in this plan will continue and potentially complete the work initiated in 2005.

Site Partners

A portion of the work planned at this site will be implemented with grant funding provided by the State Coastal Conservancy directly to the project partner. The grant recipient for this site is:

San Mateo County Mosquito Abatement District, 1351 Rollins Road, Burlingame, CA 94010; *James Counts, Field Operations Supervisor*, (650) 344-8592. james@smcmad.org The San Mateo County Mosquito Abatement District (SMCMAD) has been working along the shoreline of San Mateo County since 1953, and has extensive knowledge of the marshes and shoreline as well as the appropriate equipment and expertise for safe, efficient control work in many types of marshland settings. The work done at Cooley Landing in 2005 and 2006 was contracted through S. S. Papadapulos and Associates, Inc., but in 2007 work on this site was done through SMCMAD.

Other Partners:

StarLink Logistics, Inc. (SLLI) One Copley Parkway, Suite 309, Morrisville, NC 27560; *Mike Rafferty, SS Papadapulos & Associates, Inc.*, 116 New Montgomery St., Suite 9001, San Francisco, CA 94105-3629, (415) 896-9000, mr Rafferty@sapa.com. SLLI is the project sponsor for the Cooley Landing Salt Pond Restoration Project. In 1994, the San Francisco Bay Regional Water Quality Control Board (RWQCB) directed Rhone-Poulenc, Inc., to remediate a site adjacent to 1990 Bay Road in East Palo Alto, California (SCR Order 94-042). The remediation resulted in the loss of 3.34 acres of U.S. Army Corps of Engineers jurisdictional wetlands, which required mitigation at a 3:1 ratio. To mitigate for the loss of wetlands occurring as a result of this work, the Cooley Landing Wetland Restoration Mitigation and Monitoring Plan (H.T. Harvey & Associates and Phillip Williams and Associates, 1998) proposed the restoration of 115 acres of tidal wetland at the Cooley Landing site.

Midpeninsula Regional Open Space District, 330 Distel Circle, Los Altos, CA 94022-1404; *Cindy Roessler, Resource Manager*, (650) 691-1200, croessler@openspace.org. Cooley Landing is part of the Ravenswood Open Space Preserve owned by the Midpeninsula Regional Open Space District. Cooley Landing will continue to be part of the Ravenswood Open Space Preserve following completion of the restoration of the former salt pond.

Site Description

Site 16: Cooley Landing is a 165-acre salt marsh restoration site located at the northwestern point of the South San Francisco Bay Estuary, south of the Dumbarton Bridge and adjacent to the point where the Hetch-Hetchy Aqueduct makes landfall on the western shore at Menlo Park (see Attachment 3, "*Spartina* Control Site Maps"). The site is a former salt production evaporator pond that is undergoing restoration to tidal marsh. Initial restoration activities were completed between September and December of 2000, and included the excavation of two breaches through the east levee at locations of historic tidal channels. Re-vegetation of the former salt pond is expected to occur through natural colonization. Performance criteria for the restoration of Cooley Landing requires 70 percent cover of salt marsh vegetation and less than five percent cover of non-native vegetation by the tenth year following restoration. Cooley Landing is part of the Ravenswood Open Space Preserve.

Treatment of the non-native *Spartina* at Cooley Landing began in 2003 with mowing implemented on the small patches of non-native *Spartina* that were identified in the channel on the south side of the main marsh, along the southern inner bank of the Bay-side levee, and on the outer bank of the levee. No other treatments were done on the site in this year.

In 2004, applications of glyphosate herbicide were made to a portion of the infestation in the marsh, predominantly along the central wooden walkway that bisects the marsh and around the edges of the levee system that borders the marsh. The infestation at this time was still somewhat limited, though the clones on the outer edge of

the levees continued to expand. These areas were also treated in 2004. Unfortunately, the treatments done in 2004 resulted in very poor efficacy.

In 2005, limited ground-based treatments were again used, including the use of an airboat to access the central, expanding portions of the infestation in the marsh. This year however, saw the beginning of the use of imazapyr herbicide in place of glyphosate. Again the edges of the marsh and the boardwalk areas were targeted, with truck mounted spray equipment and backpacks, respectively. This work resulted in discernable dead areas, but the overall impact on the infestation as a whole was small. As can be typical with the first season of imazapyr application, some treated plants were impacted, but not completely killed. At the beginning of 2006, the infestation was still expanding in the marsh.

In 2006 aerial applications began at Cooley, with a helicopter equipped with a boom flying low over the marsh plain to apply the imazapyr herbicide mixture. Most of the marsh area that contained non-native *Spartina* was treated in this way, and by treatment season in 2007, the majority of the infestation in the marsh was showing signs of being controlled. Notable areas of exception include the zones under the power lines that the helicopter could not treat, and those areas outside of the main marsh.

In 2007, aerial applications were again done on the site, but this time the aerial effort was followed by a ground-based treatment along the periphery of the marsh and within the marsh along the boardwalk. Applicators used trucks along the levees and backpacks within the marsh itself to get at those areas that were inaccessible to the helicopter. Efficacy estimates from this treatment effort will be conducted in late spring or early summer of 2008.

The infestation at Cooley Landing has been diminished by the treatments done on the site, but as of winter 2007, there remain significant clonal patches of non-native *Spartina* in the marsh. The main areas of continued infestation are underneath the power lines that run north-south through the marsh, where helicopter treatments have not been able to access, and near the mouths of the breached levees on the east side of the marsh. These areas contain the extremely heterogeneous mixture of *Spartina* morphologies indicative of the hybrid swarm. There is the potential that the 2007 treatments in these areas will have reduced the extent of these hybrids, but final efficacy assessments of the 2007 work can only occur in late spring or early summer 2008.

An additional area of concern is along the outer edge of the marsh. Areas to the north and northwest of the main portion of the marsh support mixed marsh pickleweed communities and do contain several large non-native hybrid *Spartina* clones. As of winter 2007, there were only a few of these clones and they were all treated earlier in the year, but they could threaten to expand in the area if uncontrolled. The last area of concern at the Cooley Landing site is on the eastern Bay edge of the marsh. This area has received several seasons of control work, yet still supports scattered remnant patches of non-native *Spartina* within sizeable swards of native *Spartina foliosa*. Continued, targeted control work in this area will be very important in controlling the infestation at the site overall.

Treatment Strategy, Methods, and Timing

Method: Imazapyr herbicide application

Equipment: Amphibious Vehicles
Truck-mounted spray equipment
Backpacks
Boats
Aerial (helicopter) broadcast applications

Timing: June-August start time for ground-based and aerial treatments

The efficacy assessments of the 2007 treatments at Cooley will be used to determine whether one or more treatment methods should be used on the remaining non-native *Spartina* in this marsh. Broadcast aerial applications of imazapyr herbicide to the exposed areas of the marsh (where the marsh is not proximate to power lines) should be completed in early July.

Around this time, either preceding or following aerial applications, the site should be targeted for ground-based treatment in the areas that are either inaccessible to the aerial applications or where the extent of the *Spartina* has been reduced to a level where aerial broadcast applications would be inefficient. For the central portions of the marsh that would be difficult or dangerous to access on foot, amphibious vehicles should be used at low tide to both access the clones targeted for treatment and to ferry materials to applicators working in the marsh. Applica-

tors can also access the central portion of the marsh via the wooden walkway that runs under the power lines on the site. As appropriate, boats can be used at a suitable tide to do treatment or ferry applicators and materials or both. Trucks working along the levees that surround the marsh can access those plants that are within the radius of the hose rig on the truck.

Monitoring Requirements

Cooley Landing Salt Pond was colonized by vegetation during the main expansion of non-native *Spartina* hybrids in the central and south bay in the early 2000's. As a result, the site has supported an extremely heterogeneous mixture of *Spartina* hybrid phenotypes adjacent to native *Spartina foliosa* stands. Field identification of plants targeted for treatment becomes extremely difficult when you combine the occasional sub-lethal effects of herbicide applications that can result in morphological similarities between treated hybrids and adjacent natives, newly establishing native seedlings that are indistinguishable from hybrid seedlings, as well as an undulating substrate that distorts the relative heights of individual *Spartina* plants in the marsh. For these reasons, the *Spartina* in Cooley Landing should be extensively sampled for genetic analysis, and the results of this sampling effort will inform the treatment of the plants on the ground. Parallel transect sampling of all patches of *Spartina* in this marsh will be necessary to determine the location of each of the hybrid individuals found here.

Environmental Compliance

Complete environmental compliance information, analyses, and mitigations were presented in the original control plan for this site (Invasive *Spartina* Control Plan for Cooley Landing Salt Pond Restoration, San Mateo County, TSN: ISP-2004-16, 2005-2007 Control Seasons, May 2005), and are incorporated by reference into this update plan.

The site boundaries remain as defined in that plan, and no new species or other significant environmental factors have been identified. Because the area of invasive *Spartina* slated for treatment in 2008-2010 is significantly less than the area treated in 2005-2007, any potential environmental impacts resulting from treatment are expected to also be less, and thus there are no new or increased impacts.

Updated Site-Specific Project Impact Evaluation and Site-Specific Project Mitigation checklists have been provided in Attachment 2.